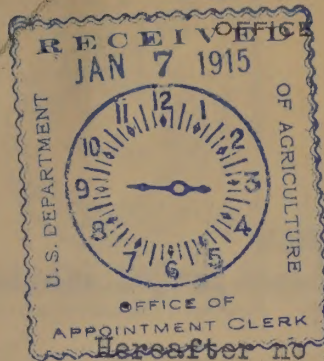


DEPARTMENT OF AGRICULTURE,



OFFICE OF THE ~~ASSISTANT~~ SECRETARY,
WASHINGTON, D. C.

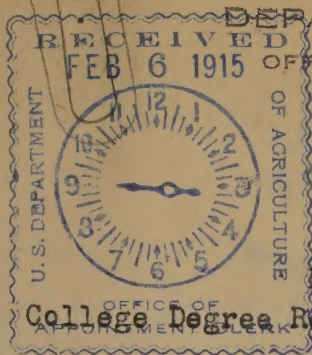
January 4, 1915.

MEMORANDUM NO. 116.

Hereafter no Bureau, Division or Office in the Department of Agriculture shall establish a college degree, except a degree in veterinary science, as an unqualified prerequisite for admission to a competitive examination for any position in the classified service of the Department. In cases in which it is deemed essential to limit the number of competitors to persons of special attainments, it shall be adequate to require that the applicant either have a college degree or submit satisfactory evidence of education or experience equivalent thereto, in its bearing upon the work of the position to be filled. The Bureaus, Divisions and Offices of the Department will observe this rule in the preparation of tentative subjects, weights and prerequisites for submission to the Civil Service Commission, in connection with requests for the establishment of new registers.

Carl Vrooman

Acting Secretary.



DEPARTMENT OF AGRICULTURE,
OFFICE OF THE ~~ASSISTANT~~ SECRETARY,
WASHINGTON, D. C.

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Return to
the Secretary's File Room

February 2, 1915.

MEMORANDUM NO. 116. (*Revised.*)

College Degree Requirements of Applicants for Scientific or
Technical Positions.

Hereafter no Bureau, Division or Office in the Department shall establish a college degree as an unqualified prerequisite for admission to a competitive examination for any position in the classified service of the Department, except in cases in which the position to be filled, like that of veterinary inspector, is of such scientific or technical character that both the Chief concerned and the Assistant Secretary consider a college degree as an essential prerequisite. In all other cases in which a college degree is required, an alternative requirement of experience in line with the work of the position to be filled shall be made. The Bureaus, Divisions and Offices of the Department will observe this rule in the preparation of tentative subjects, weights and prerequisites for submission to the Civil Service Commission in connection with the establishment of new registers.

Carl E. Roman

Acting Secretary.



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Please return to
the Secretary's File Room

DEPARTMENT OF AGRICULTURE
WASHINGTON

January 5, 1914.

MEMORANDUM No. 117

Amending Paragraph 104 of the Administrative Regulations,
"Use of Penalty Envelopes."

-----oOo-----

Paragraph 104 of the Administrative Regulations of this
Department is hereby amended to read as follows:

"104. Use of Penalty Envelopes.- Official mail ~~matter~~
matter in penalty envelopes must bear the words 'Official Business'
to entitle it to free transportation in the mails. The use of
penalty envelopes to avoid the payment of postage on other than
strictly official business is absolutely prohibited.

"When an officer of the department writes to a private
party on official business for information of value to the depart-
ment he may inclose with his letter an official envelope properly
addressed to himself to cover the reply.

"Penalty envelopes or penalty labels must not be furnished
merchants or others from whom articles are purchased for the de-

livery of such articles by transmission through the mails. Penalty envelopes furnished by the department to persons not in the employ thereof, or who are not officers of the Government, must not be used by them for the transmission in the mails, free of postage, of any matter other than official information (correspondence) and indorsements relating thereto. But penalty envelopes addressed to the department may be furnished to publishers to be used by them in transmitting copies of their publications for which no charge is made, when such publications contain official information necessary to the Department. Penalty envelopes bearing a return address may also be supplied to persons in possession of public documents for use by them in returning such documents to the department."

A. A. Martin

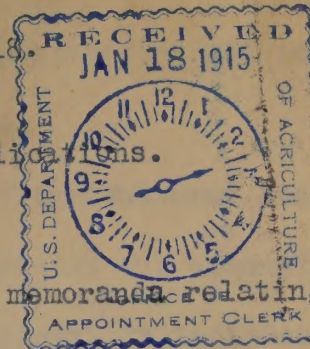
Secretary.

DEPARTMENT OF AGRICULTURE,
OFFICE OF THE ~~ASSISTANT~~ SECRETARY,
WASHINGTON, D. C.

January 14, 1915.

MEMORANDUM NO. 118.

In Regard to Publications.



FILED
★ OCT 16 1936 W
Please return to
the Secretary's File Room

The following outline of the memoranda relating to the different series now published by the Department and of the principles to be followed in submitting papers either for publication with the Department or in outside journals is issued to facilitate the preparation and submission of manuscripts.

1. Farmers' Bulletins shall be concise, simple, specific statements regarding subjects of interest to farmers; statements of specific directions for procedure of farm operations in modern farm practice are especially desired. These bulletins should be short, usually from 8 to 16 pages.

2. (a) Department Bulletins shall be popular or semi-technical descriptions or discussions of facts or conditions of importance to agriculture. Papers that are essentially for furthering agricultural propaganda and Departmental policies will also be included.

(b) The "Professional Papers" series of the Department Bulletins shall contain those bulletins which present information in technical or professional language especially for the benefit of those engaged in highly specialized professions related to agriculture, such as baking, fruit packing, paper making, lumbering, cold storing, etc.

January 10, 1917

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In Reply, Please Refer to
File No. _____

The following information is being furnished to you for the information of the War Department. It is requested that you keep this information confidential and not discuss it with anyone outside the War Department.

1. The War Department is currently conducting a study of the military situation in the Philippines. The results of this study will be reported to the War Department in the near future.

2. The War Department is also conducting a study of the military situation in the United States. The results of this study will be reported to the War Department in the near future.

3. The War Department is also conducting a study of the military situation in the world. The results of this study will be reported to the War Department in the near future.

3. Papers for the Yearbook shall be descriptive and educational in type and the style of illustration and presentation resemble that of the modern magazine.

4. Papers for the Journal of Agricultural Research and its supplements shall be concise reports of the essential data and conclusions of original research of direct or indirect economic importance to agriculture.

5. Papers for the series of Reports of the Department shall be reports of value to agriculture, including records of empirical data, statistical studies, and taxonomic investigations, yet which are not suitable for publication as Bulletins, Yearbook papers, or research articles.

6. In order to facilitate the use of different publications of the Department upon related subjects, occasional classified reference lists, consisting of number, title, and a single descriptive sentence for each bulletin, will be issued in both the Farmers' Bulletin series and the Department Bulletin series. These reference lists shall be classified broadly according to subject, and hereafter, where practicable, the group or section which is germane to the subject of a bulletin may be reprinted on the back cover or upon blank pages.

Excepting The Agricultural Outlook and such other publications as the ~~Editorial Committee~~ *Committee on Examination of Manuscripts* may consider to be ephemeral in nature, Department Bulletins and Farmers' Bulletins of 32 pages or over shall carry covers of rope manila No. 419. Any Bulletin of fewer than 32 pages which for some special reason the Committee may consider as

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deserving of a cover may be submitted to the Secretary or the Assistant Secretary for decision, and upon approval may carry the specified cover.

Excepting the publications of the Weather Bureau, the North American Fauna of the Biological Survey, and the Seed and Plant Introduction Inventory of the Bureau of Plant Industry, the "Lists" of the Division of Publications, the Weekly News Letter, the Service and Regulatory announcements, and those publications specifically required by statute, all formal publications of the Department are to be issued in the series outlined above. Office circulars and any special circulars, whether printed or mimeographed, should differ in make-up from the publications described above, either in size or color of paper; should be numbered in inconspicuous type, and at least two copies forwarded to the Document Collection of the Main Library at the time the circular is issued.

Bureau chiefs should submit for publication from their Bureaus only papers which are in accordance with the general policy that papers issued by the Department of Agriculture, whether of a propaganda, a descriptive, or an investigational character, shall possess definitely constructive value in relation to the essential problems of agriculture, incident to the improvement of agricultural conditions.

Articles which do not fall within the scope of the preceding outline may be approved for publication in outside magazines and

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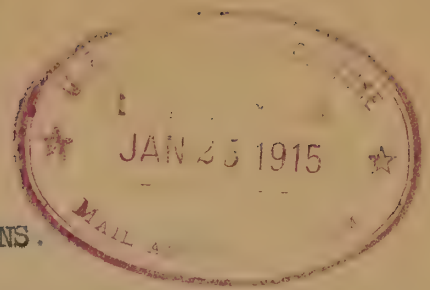
technical journals. Carbon copies should be forwarded to the Office of the Secretary for approval and for permanent filing.

Carl V. Roemer
Acting Secretary.

11/11/11

11/11/11

MEMORANDUM IN REGARD TO PUBLICATIONS.



The following outline of the memoranda relating to the different series now published by the Department and of the principles to be followed in submitting papers either for publication with the Department or in outside journals is issued to facilitate the preparation and submission of manuscripts.

1. Farmers' Bulletins shall be concise, simple, specific information regarding subjects of interest to farmers; statements of specific directions for procedure of farm operations in modern farm practice are especially desired. These bulletins should be short, usually from 8 to 16 pages.

2. (a) Department Bulletins shall be popular or semi-technical descriptions or discussions of facts or conditions of importance to agriculture. Papers that are essentially for furthering agricultural propaganda and Departmental policies will also be included.

2. (b) The "Professional Papers" series of the Department bulletins shall contain those bulletins which present information in technical or professional language especially for the benefit of those engaged in high/ specialized professions related to agriculture, such as baking, fruit packing, paper making, lumbering, cold storing, etc.

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
CHICAGO, ILLINOIS

TO THE HONORABLE
THE PRESIDENT OF THE UNIVERSITY OF CHICAGO
CHICAGO, ILLINOIS

FROM
THE DEPARTMENT OF CHEMISTRY
CHICAGO, ILLINOIS

RECEIVED
JANUARY 10, 1950
THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
CHICAGO, ILLINOIS
FROM THE DEPARTMENT OF CHEMISTRY
CHICAGO, ILLINOIS

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
CHICAGO, ILLINOIS

3. Papers for the Yearbook shall be descriptive and educational in type and the style of illustration and presentation resemble that of the modern magazine.

4. Papers for the Journal of Agricultural Research and its supplements shall be concise reports of the essential data and conclusions of original research of direct or indirect economic importance to agriculture.

5. Papers for the series of Reports of the Department shall be reports of value to agriculture, including records of empirical data, statistical studies, and taxonomic investigations, yet which are not suitable for publication as Bulletins, Yearbook papers, or research articles.

Excepting the publications of the Weather Bureau, the North American Fauna of the Biological Survey, and the Seed and Plant Introduction Inventory of the Bureau of Plant Industry, the "Lists" of the Division of Publications, and those publications specifically required by statute, all formal publications of the Department are to be issued in the series outlined above. Office circulars, whether printed or mimeographed, should differ in make-up from the publications described above, either in size or color of paper; should be numbered in inconspicuous type, and at least ten copies filed with the Document Section of the Library.

Bureau chiefs should submit for publication from their Bureaus only papers which are in accordance with the general policy that papers issued by the Department of Agriculture, whether of a

1. The first part of the report is a general introduction to the subject of the study.

2. The second part of the report is a detailed description of the methods used in the study.

3. The third part of the report is a discussion of the results of the study.

4. The fourth part of the report is a conclusion and a list of references.

5. The fifth part of the report is a summary of the findings of the study.

6. The sixth part of the report is a list of references.

7. The seventh part of the report is a list of references.

propaganda, a descriptive, or an investigational character, shall possess definitely constructive value in relation to the essential problems of agriculture, incident to the improvement of agricultural conditions.

Articles which do not fall within the scope of the preceding outline may be approved for publication in outside magazines and technical journals. When popular or technical articles for outside publication discuss questions of agricultural policy or are based upon data secured in Departmental investigations, carbon copies should be forwarded to the Secretary for approval and for permanent filing.

THE [illegible] OF [illegible]

BY [illegible]

[illegible]

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DEPARTMENT OF AGRICULTURE,
OFFICE OF THE ASSISTANT SECRETARY,
WASHINGTON. D. C.

MEMORANDUM FOR THE ASSISTANT SECRETARY,

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In re memorandum on publications:

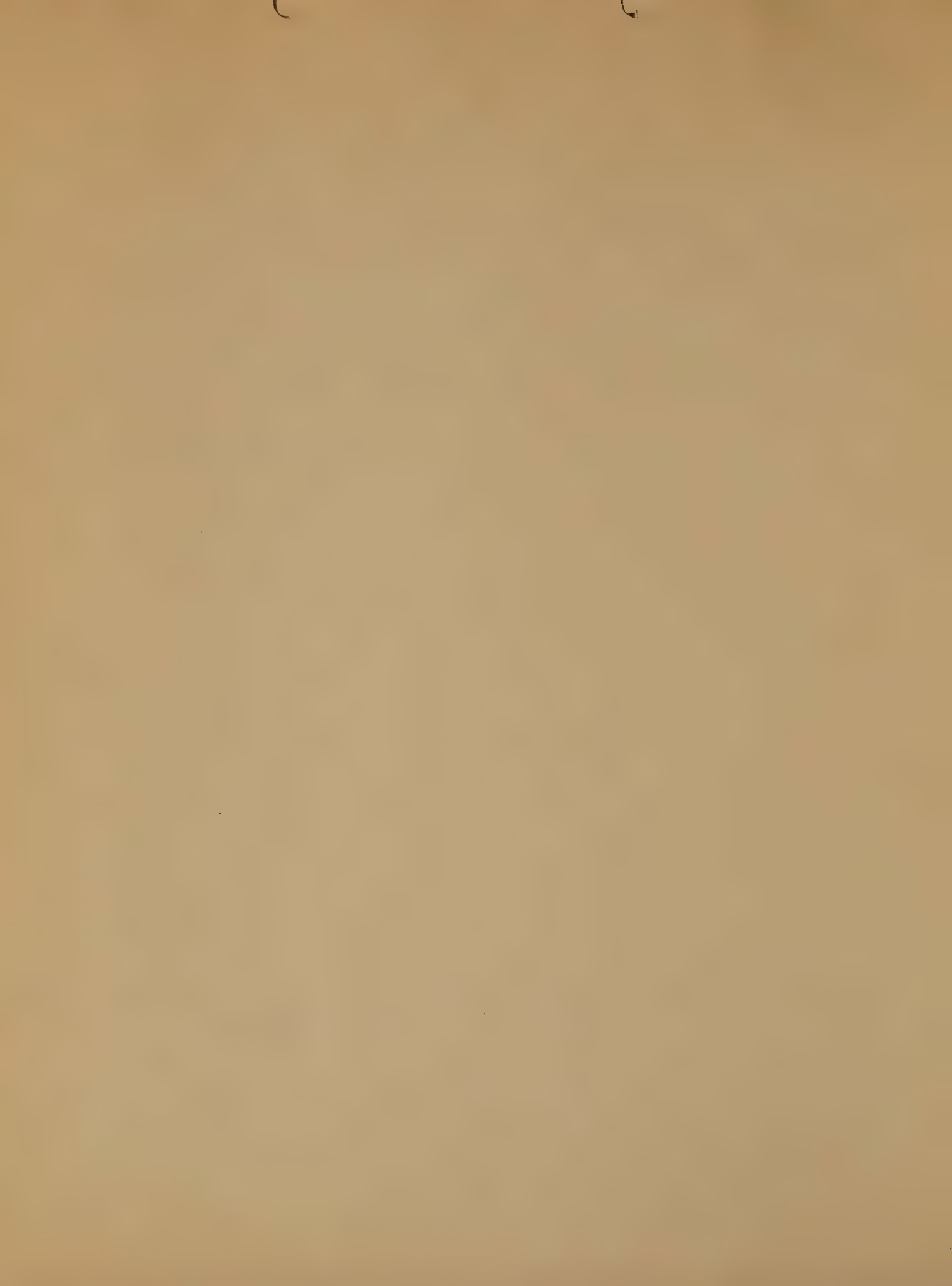
The various commentaries on the proposed memorandum on publications would seem to justify the consideration of the following matters in addition to those already covered by the memorandum:

CLASSIFICATION BY SUBJECTS: The need of such classification is self-evident. Fear of the confusion and trouble that will be entailed by a change from the present system seems to be the prime reason advanced in opposition to such a classification. Since the present system is admittedly faulty and since the confusion that hangs upon change is cumulative it would seem that the sooner the change is made the better for the service in the long run. I would suggest that present serial numbers be continued as "Whole" numbers, and that bulletins be grouped by subjects in sub-series, such numbering to be begun after Mr. Greathouse, in cooperation with the various bureaus, has classified existing available publications and has assigned to them sub-serial numbers. Thus the original error will, in a measure, be rectified. These changes will be along the line of Mr. Wharton's original suggestion.

COVERS: Commentaries seem almost unanimously in favor of a return to covers, at least for departmental bulletins. Personally I think that any publication that is worth keeping is worthy of a cover to keep it. From the standpoint of typography it is impossible to make a good job of any publication of 32 pages or over without putting it in a cover. I would suggest that

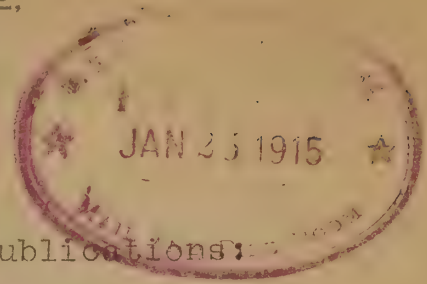
the ban on covers be rescinded as regards all but ephemeral publications, and that a light weight, tough manila be used for covers instead of the less durable and more expensive granite cover stock that has been in vogue hitherto. Manila is the best cheap cover stock and it has the advantage of being workable with half-tones, so that if occasion should arise cuts could be printed on covers if they were of this stock. See sample (A), submitted herewith, which I think an ideal cover for service.

R. E.



DEPARTMENT OF AGRICULTURE,
OFFICE OF THE ASSISTANT SECRETARY,
WASHINGTON, D. C.

DIGEST OF MEMORANDA ON PUBLICATIONS



Dr. Kellerman suggests five series of publications:

- 1--Farmers' Bulletins.
- 2--Department Bulletins (including professional papers).
- 3--Papers for the Year Book.
- 4--Papers for the Journal of Agricultural Research.
- 5--Papers for the Series of Reports of the Department.

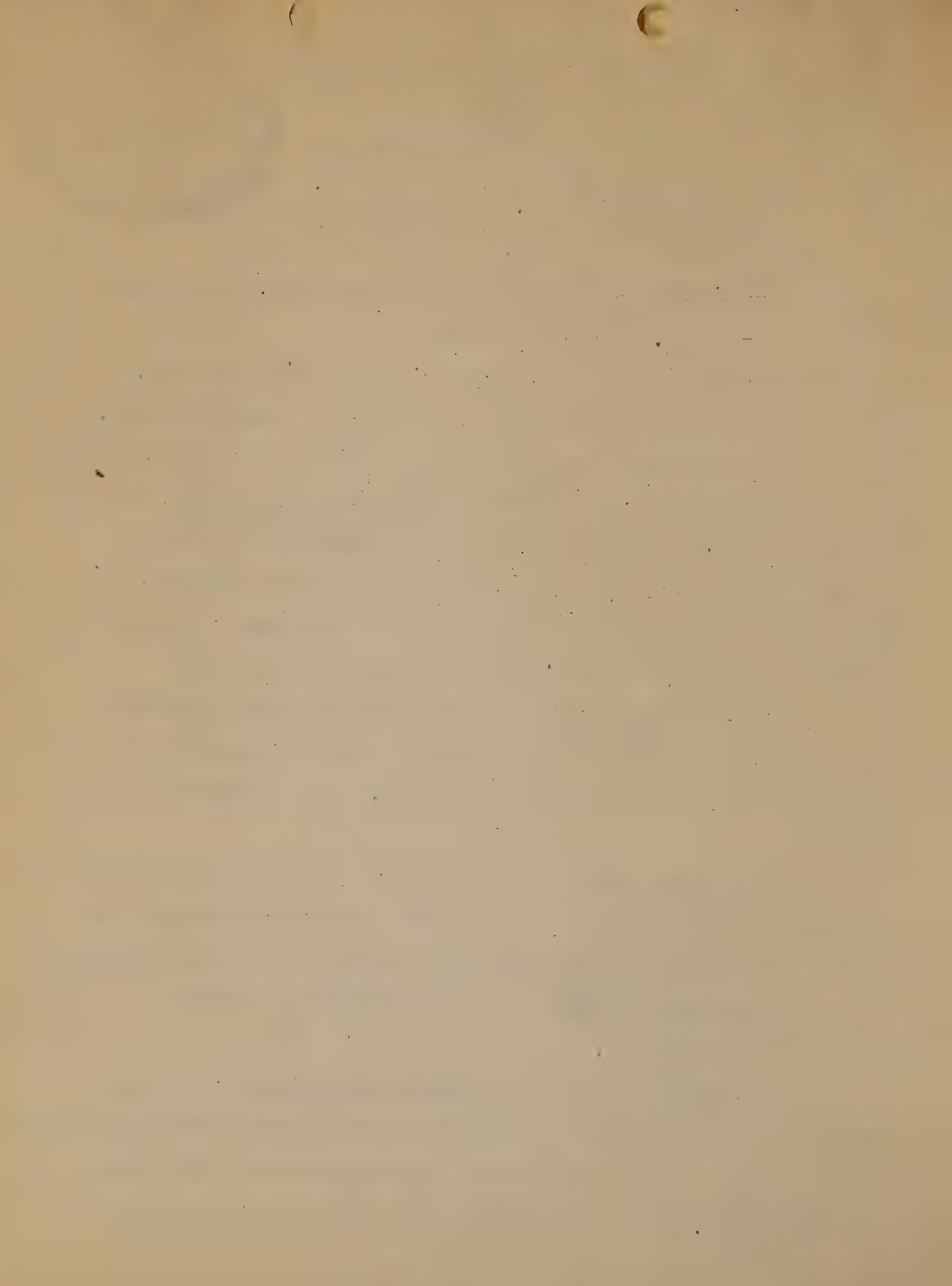
He suggests that all formal publications of the department, with certain exceptions, including statutory publications, be confined to these series and that office circulars be printed on paper of size or color distinctive, that they be numbered and that copies thereof be filed in the document section. He suggests a return to the use of covers for Departmental Bulletins. 2

Col. Caffey concurs on the suggestion that copies of even ephemeral circulars be preserved but is not impressed with the suggestion that all circulars be numbered. Gives no reason in this regard.

Dr. Melvin concurs on suggestion that there be a repository of all published papers and suggests that the library should take care of the matter. Sees no objection to giving circulars numbers.

Dr. Alsberg ~~submits~~ ^{submits} a general endorsement of Dr. Kellerman's suggestions.

Mr. Arnold Concurs in general but thinks that covers should be used only on publications too bulky to be bound satisfactorially without covers. Says present policy on covers saves about \$1500 per annum. Calls attention to the fact that the Division



of Publication already has in its possession two full bound sets of Department publications but lacks a place to keep them. Thinks they ought to be turned over to the library.

Mr. Wharton suggests that department publications be classified by subjects and that a new periodical be added to the list, primarily to keep the people of the department, especially those in the field, in touch with the work of the department as a whole.

Dr. Kellerman does not concur with Mr. Wharton's suggestion as to the establishment of a new periodical, pending the maturity of kindred plans of the States Relation Service. Makes no comment on Mr. Wharton's suggestion as to the grouping of publications by subjects.

Mr. Greathouse thinks that there should be but two series for all department publications other than farmers' bulletins, one to include all publications of permanent value, to be called "bulletins", the other to include all ephemeral publications and to be called "circulars". He suggests that all publications of permanent value, including farmers' bulletins, should have covers, that publications in the same general field should be bound together and furnished free to libraries and at cost to individuals and that libraries of farmers' bulletins should be established in country schools and post offices.

Mr. Handy urges a return to the use of covers for all major publications of all series and submits figures to show that the calculated saving on covers has not actually been realized. (\$305,000 spent this year with 1056 new publications as against \$318,000 spent last year with 1656 new publications.)

Mr. Potter thought the original plan too narrow and

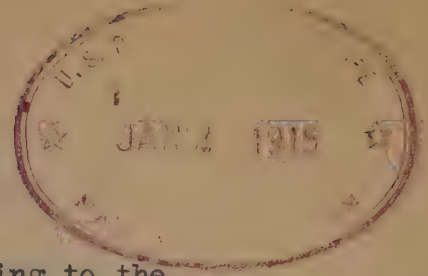


Dr. Kellerman modified the memorandum in line with Mr. Potter's suggestion so as to give the latitude desired by the Forest Service.



Revised Memorandum

MEMORANDUM IN REGARD TO PUBLICATIONS.



The following outline of the memoranda relating to the different series now published by the Department and of the principles to be followed in submitting papers either for publication with the Department or in outside journals is issued to facilitate the preparation and submission of manuscripts.

1. Farmers' Bulletins shall be concise, simple, specific information regarding subjects of interest to farmers; statements of specific directions for procedure of farm operations in modern farm practice are practically desired. These bulletins should be short, usually from 8 to 16 pages.

2. (a) Department bulletins shall be popular or semi-technical descriptions or discussions of facts or conditions of importance to agriculture. Papers that are essentially for furthering agricultural propaganda and Departmental policies will also be included.

(b) The "Professional Papers" series of the Department bulletins shall contain those bulletins which present information in technical or professional language especially for the benefit of those engaged in highly specialized professions related to agriculture, such as baking, fruit packing, paper making, lumbering, cold storing, etc.

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4. Papers for the Journal of Agricultural Research and its supplements shall be concise reports of the essential data and conclusions of original research of direct or indirect economic importance to agriculture.

5. Papers for the series of Reports of the Department shall be reports of value to agriculture, including records of empirical data, statistical studies, and taxonomic investigations, yet which are not suitable for publication as Bulletins, Yearbook papers, or research articles.

6. Excepting the publications of the Weather Bureau, the North American Fauna of the Biological Survey, and the Seed and Plant Introduction Inventory of the Bureau of Plant Industry, the "Lists" of the Division of Publications, and those publications specifically required by statute, all formal publications of the Department are to be issued in the series outlined above. Office circulars, whether printed or mimeographed, should differ in make-up from the publications described above, either in size or color of paper; should be numbered in inconspicuous type, and at least ten copies filed with the Document Section of the Library.



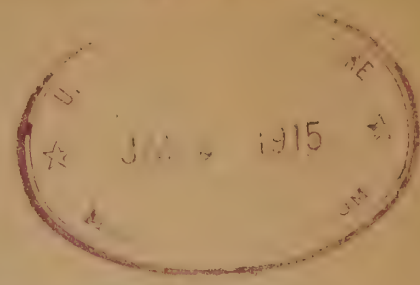
Bureau chiefs should submit for publication from their Bureaus only papers which are in accordance with the general policy that papers issued by the Department of Agriculture, whether of a propaganda, a descriptive, or an investigational character, shall possess definitely constructive value in relation to the essential problems of agriculture, incident to the improvement of agricultural conditions.

Articles which do not fall within the scope of the preceding outline may be approved for publication in outside magazines and technical journals. When popular or technical articles for outside publication discuss questions of agricultural policy or are based upon data secured in Departmental investigations, carbon copies should be forwarded to the Secretary for approval and for permanent filing.



*Suggested
Memorandum* Original Memorandum.

Memorandum in Regard to Publications.



The following outline of the memoranda relating to the different series now published by the Department and of the principles to be followed in submitting papers either for publication with the Department or in outside journals is issued to facilitate the preparation and submission of manuscripts.

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2. (a) Department bulletins shall be popular or semi-technical descriptions or discussions of facts or conditions of importance to agriculture. Papers that are essentially for furthering agricultural propaganda and Departmental policies will also be included.

(b) The "Professional Papers" series of the Department bulletins shall contain those bulletins which present information in technical or professional language especially for the benefit of those engaged in highly specialized professions related to agriculture, such as baking, fruit packing, paper making, lumbering, cold storing, etc.

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4. Papers for the Journal of Agricultural Research and its supplements shall be concise reports of the essential data and conclusions of original research of direct or indirect economic importance to agriculture.

5. Papers for the series of Reports of the Department shall be records of empirical data, statistical studies, taxonomic investigations, and other technical and scientific reports of fundamental value to agriculture, yet that lack the distinctive character of the Professional Paper series of bulletins or the Research articles of the Journal of Agricultural Research.

Excepting the publications of the Weather Bureau, the North American Fauna of the Biological Survey, and the Seed and Plant Introduction Inventory of the Bureau of Plant Industry, the "Lists" of the Division of Publications, and those publications specifically required by statute, all formal publications of the Department are to be issued in the series outlined above. Office circulars, whether printed or mimeographed should be upon standard letter-size paper, should be numbered in inconspicuous type, and at least ten copies filed with the Document Section of the Division of Publications.

Bureau chiefs should submit for publication from their Bureaus only papers which are in accordance with the general policy that papers issued by the Department of Agriculture, whether of a propaganda, a descriptive, or an investigational character, shall possess definitely constructive value in relation to the essential problems of agriculture, incident to the improvement of agricultural conditions.

Articles which do not fall within the scope of the preceding outline may be approved for publication in outside magazines and technical journals. When popular or technical articles for outside publication discuss questions of agricultural policy or are based upon data secured in Departmental investigations, carbon copies should be forwarded to the Secretary for approval and for permanent filing.

Kellerman
JOURNAL OF AGRICULTURAL RESEARCH.

PUBLISHED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE ASSOCIATION OF
AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.

Washington, D. C., September 15, 1914.

The Honorable
The Assistant Secretary of Agriculture.

Sir:

Various memoranda relating to publications have been addressed to different committees and occasionally either overlapped or contradicted previous memoranda. In an attempt to minimize confusion with regard to the different avenues of publication, and also to illustrate the desirability for certain additional minor reforms, I have prepared the inclosed memorandum which is an attempt to summarize the principles embodied in the various memoranda now on record, and have included two suggestions which have not yet been adopted. The suggestions which are included for approval or disapproval are underlined. In order to illustrate my reason for advocating the elimination of unnumbered series and the recording of all published matter of the Department I am forwarding herewith certain exhibits.

The office circular entitled "Plant Immigrants" and lettered "A" is, in my opinion, a satisfactory circular publication. It is on letter size paper and therefore cannot be confused with our more formal publications such as the bulletins of the Department, the Department Yearbook, the Journal of Agricultural Research, or the Experiment Station Record. At the same time it is possible to make a brief and accurate record of the different numbers for bibliographical purposes.

The office circulars bearing the letter "B" are essentially circular letters. At the same time they present information which is of considerable importance and from which, from time to time, it



may be desirable for people within or without the Department to make quotation or other reference. At the present time, however, no system exists by which any copies of these publications are preserved and it is especially difficult to make satisfactory records since each circular letter would necessarily be indexed as a book. I think a centralized system of numbering, such as is in force with regard to Farmers' Bulletins and Department Bulletins, is preferable. Any system of numbering which would render possible easy record and easy reference for these circular letters, in my opinion, would be advantageous.

The pamphlet lettered "C" I believe to be objectionable for the reason that information which is of great interest to a large portion of our public is issued in separate series instead of in the numbered series of Department Bulletins. In my opinion the Service and Regulatory Announcements constitute suitable material for Department bulletins. The cabalistic letters, "S.R.A.-B.P.I.1." and "S.R.A.-Fed.Hort.Bd.1." should be carried as sub-heads or foot-notes on the face of the title page of the proposed Department Bulletin of the regular numbered series.

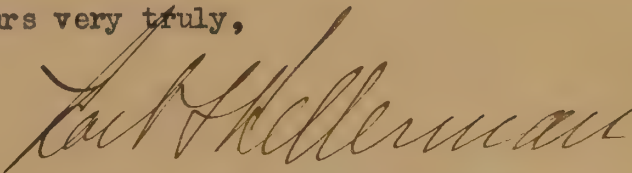
? The publications bearing the letter "D" in my opinion are issued in the most troublesome form of any other existing series. While in size, selection of type and general make-up they are practically identical with the numbered Department Bulletins, they bear no serial designation of any kind. It is therefore impossible to determine what copies have been issued, except by reference to the issuing office or by an examination of the printing requisitions in the Division of Publications.

It is possible that the two copies referring to lists of publications should be issued as a pocket handbook or as a circular letter rather than to have it form a portion of the numbered series of bulletins. The remainder of the "D" exhibit I believe should have been issued as numbered Department Bulletins rather than as nondescript publications.

In my opinion even such ephemeral material as is represented by exhibit "E" should be given a number of some sort by the Division of Publications and copies should be retained in some record room or document section. The value of preserving such records as these becomes more apparent when changes are made in the organization of different lines of work, or when a man in charge of some line of work leaves the Department and the conduct of the work devolves upon some man with comparatively little information regarding the history of the work which he undertakes.

I should like to suggest one further change in our present system of issuing publications, though I recognize that this suggestion is opposed to one of the most definite rules that has been established for the Departmental series. I urge the adoption of some form of cover, preferably gray, steel-blue, or tan, for the Department Bulletins. The slight additional cost of putting covers upon these publications I do not believe to be a valid objection in view of the fact that it increases the likelihood of their being preserved and therefore actually increases the probable period of use of each copy. I do not object to the absence of covers from Farmers' Bulletins. Publications in this series are intended for ephemeral existence and I believe there is no objection to their being reprinted and issued in very large numbers where demand for them exists. The Department Bulletins, however, are intended for conveying information important for occasional or constant reference and deserve somewhat the same consideration as displayed by a commercial house in issuing its catalogues and other advertising matter.

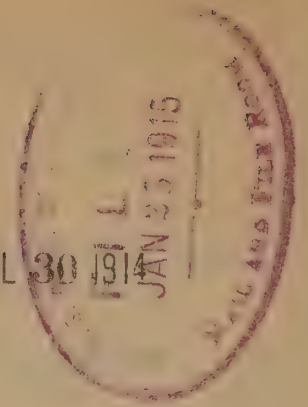
Yours very truly,

A handwritten signature in cursive script, reading "Louis H. Sherman". The signature is written in dark ink and is positioned above the printed name.

Chairman, Editorial Committee.

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SOLICITOR
WASHINGTON

JUL 30 1914



MEMORANDUM FOR THE SECRETARY:

Referring to the letter addressed to you on July 18, 1914, by the chairman of the editorial committee, submitted to this office for comment, I beg to advise you that in my opinion there can be no question but that there should be permanently deposited in the library of the department, one or more copies of each publication of the department. I am not impressed, however, by the suggestion that all circular letters, etc., should be serially numbered. It may be that the library may wish to number the letters for the purpose of indexing or cataloging, but it seems to me unnecessary that all circulars and other publications should be serially numbered.

With respect to the Service and Regulatory Announcements issued in accordance with memorandum No. 57, no change seems to be required, so far as this office is concerned. These announcements, in my opinion, serve a useful purpose in their present form, and it is difficult for me to perceive how any substantial inconvenience can result to readers or librarians who are willing to take the trouble to acquaint themselves with the organization and activities of the department. It is suggested, if you have not already done so, that you obtain the views of the bureaus which issue such Service and Regulatory Announcements, before deciding whether any change shall be made in the present plan of publishing.

Walter G. Laffey
Solicitor

REPORT

1. Introduction

The purpose of this report is to provide a detailed analysis of the data collected during the experiment. The data was collected over a period of six months, and the results are presented in the following sections.

The first section of the report describes the experimental setup and the methods used to collect the data. The second section presents the results of the experiment, and the third section discusses the implications of the findings.

The results of the experiment show that there is a significant correlation between the variables studied. This correlation is supported by the statistical analysis performed on the data. The findings suggest that the hypothesis proposed at the beginning of the experiment is valid.

In conclusion, the experiment has provided valuable insights into the relationship between the variables studied. The results are consistent with the hypothesis, and the findings have important implications for the field of study. Further research is needed to explore the underlying mechanisms of the observed correlation.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
WASHINGTON, D. C.

ADDRESS REPLY TO
"CHIEF OF BUREAU OF ANIMAL INDUSTRY,"
AND REFER TO

CCC/M

C-9.061

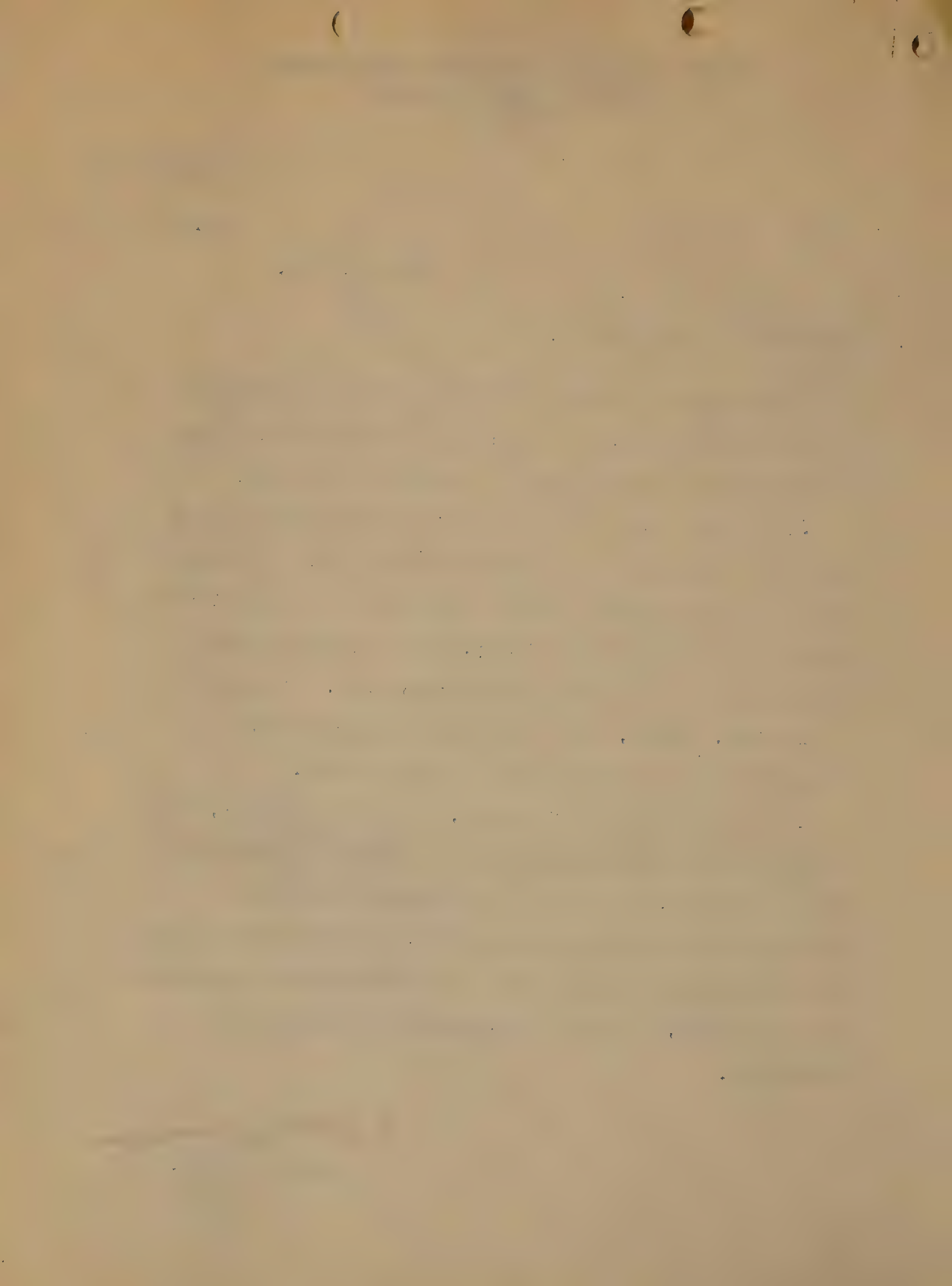


MEMORANDUM FOR THE SECRETARY:

Referring to the letter of Mr. Kellerman to you of July 18 making suggestions relative to Departmental publications, a copy of which was sent to this Bureau for comment, I beg to say:

1. Relative to the "establishment of a document section which shall be a depository of all published papers" etc., in my opinion this is a good suggestion, and such section should be established preferably in the Department library, where it could be placed without any increase in the existing organization. Care should be exercised, however, to see that the collection may not be incumbered with unimportant routine circular letters.
2. For the convenience of persons, especially librarians, who desire to understand and classify all the regulatory publications of the Department, there should be no objection to giving a Departmental number to these publications, the distribution of each publication being limited as now to the readers primarily interested and to the class, numerically few, who wish to make complete collections.

A. D. Melvin
Chief of Bureau.



Alsberg
UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF CHEMISTRY,
WASHINGTON, D. C.

IN REPLY REFER TO

MEMORANDUM TO THE SECRETARY:

With reference to memorandum submitted by Doctor Kellerman, Chairman of the Editorial Committee, to you, under date of July 18, I beg to say that I have conferred with Doctor Kellerman in this matter, and wish to submit the following:

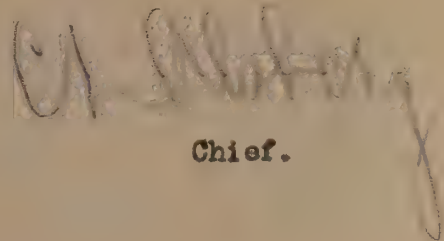
I am unqualifiedly in sympathy with the first three paragraphs of Doctor Kellerman's memorandum. I think that the Department should go a step further, and that there should be deposited in the Document Section not merely all the unnumbered publications, office leaflets, etc., but also separates of all scientific papers which are published by the Department in the scientific journals.

With reference to the last paragraph of Doctor Kellerman's memorandum I beg to say that I can see no objection to adding to the title page of the Service and Regulatory Announcements a number so as to make each individual monthly issue a part of the numbered series of the Department. It would be unwise, in my opinion, to go further than this. I should consider any plan which changed the serial paging, or otherwise affected the present system of issuing our Service and Regulatory Announcements, as undesirable. I do not agree with Doctor Kellerman that these Announcements appeal to the same class of readers as the

Memorandum to the Secretary. 2.

general bulletins. While there can be no objection to adding a serial number to the Service and Regulatory Announcements of the Bureau of Chemistry, there is very serious objection to doing anything which will interfere with the binding of each year of these Announcements by itself.

Respectfully,

A handwritten signature in cursive script, appearing to read "C. A. Montgomery", is written over the typed name "Chief".

Chief.

KR

Kellerman
JOURNAL OF AGRICULTURAL RESEARCH.

PUBLISHED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE ASSOCIATION OF
AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.

Washington, D. C., September 24, 1914.

Memorandum for the Private Secretary.

U. S. DEPARTMENT OF AGRICULTURE
FILED
JAN 25 1915
AND FILE ROOM

Dear Mr. Callander:

The reforms in numbering publications which I believe desirable are the elimination of publications which have no mechanical aids for recording and reference within our Department, and the transfer to a different type of publication of those which are now issued in form closely similar to the numbered Department bulletins.

The publication entitled "Plant Immigrants" I consider satisfactory in its present form. (This is the pamphlet marked "A").

The circular entitled "How to Send Living Plant Material to America" I consider unsatisfactory because of the fact that there are no mechanical aids for reference. A small number should be placed in the corner, either recording a Bureau of Plant Industry number or a Department serial number. Otherwise this publication I consider satisfactory in its present form. (This is the circular marked "B").

The Service and Regulatory Announcements I believe to be of popular interest and therefore, in my opinion, would be included with the numbered series of bulletins with advantage. (This is the pamphlet marked "C").

The publications to which I object especially are the unnumbered pamphlets similar in appearance to the Department bulletins. One, entitled "Menziesia, A New Stock-Poisoning Plant of the Northwestern States," I believe should have been issued

as a Department bulletin or as an announcement through the agricultural papers of the Northwest. Another, entitled "Distribution of Cotton Seed in 1914," I believe should have been issued as a circular letter instead of as a pamphlet, and the one entitled "The Work of the Umatilla Reclamation Project Experiment Farm in 1913" I believe should also have been an office circular and issued on the large sized sheets in order to be more obviously circular in character. (The three pamphlets in question are marked "D").

The various lists which are issued by the Division of Publications from time to time also should bear some mechanical designation. I would suggest that these be given List numbers. For instance, "List of Free and Available Publications of the United States Department of Agriculture of Interest to Farm Women" might be designated List No. 28. "Organization of the Department of Agriculture, 1913" might be designated List No. 29, and "List of Workers in Subjects pertaining to Agriculture and Home Economics in the U. S. Department of Agriculture and in the State Agricultural Colleges and Experiment Stations" might be designated List No. 30.

In addition I recommend the establishment of a record room where copies of circular letters and other more or less ephemeral informal publications may be preserved for future reference.

The short memorandum which is inclosed is, excepting one paragraph, a paraphrase of the various memoranda on this subject now on file and is prepared merely for the convenience of Bureau chiefs and others interested in the placing of manuscripts.

Yours very truly,



Chairman, Editorial Committee.

Arnold
UNITED STATES DEPARTMENT OF AGRICULTURE, VH
DIVISION OF PUBLICATIONS,
WASHINGTON, D. C.

September 28, 1914.

MEMORANDUM FOR THE PRIVATE SECRETARY:

I have carefully read Doctor Kellerman's memorandum to you, relative to the reforms he suggests with regard to publications, and I agree with him in practically all of his suggestions.

"Plant Immigrants" in its present form cannot, in my judgment, be classed as a publication. There does not appear to be any reason, however, why it should not be printed rather than multigraphed, in which form it would certainly be more satisfactory. The illustrations are now printed at the Government Printing Office and it would be but a short step to have all the work done there. In any event the present size might be maintained. "Plant Immigrants" bears a number and date. I do not know what distribution is made of the multigraphed copies, but, if the edition is large, it probably would be more economical to have it printed in the regular way. If it is just an office circular for preservation as a record, the form in which it is now issued may be satisfactory.

The circular entitled, "How to send Living Plant Material to America," is in the nature of office directions and the form in which it is printed seems satisfactory. For convenience, however, it should have a Bureau number or letter the same as a blank form. Such designations would be found convenient to the Bureau.

The Service and Regulatory Announcements are a new series established about a year ago and, while I agree with Doctor Kellerman

that these Announcements might be published in the numbered series of bulletins, such a change at this time would result in great confusion from which it would take a long time to recover.

Practically all the unnumbered leaflets and documents of the Bureau of Plant Industry could be appropriately printed either as Farmers' Bulletins or in the Department series of bulletins. The "Lists of Workers in Subjects Pertaining to Agriculture and Home Economics in the United States Department of Agriculture and in the State Agricultural Colleges and Experiment Stations" is best adapted for publication as a report of the Secretary's office, a series recently revived.

The suggestion to number "The Organization of the Department of Agriculture" is a good one. It should be remembered, however, that this list is no longer printed separately, but is incorporated in the "Lists of Workers in Subjects Pertaining to Agriculture, etc." above referred to.

The suggestion to number "Lists of Free and Available Publications of Interest to Farm Women" is also a good one. The number was omitted to comply with the new policy.

All the lists of publications might properly have serial office numbers affixed to them, with the possible exception of the "Monthly List," which can always readily be identified by the month to which it relates. This list for many years carried a serial number, but this was discontinued some time ago, in accordance with the new policy with reference to publications.

I do not think it necessary to put a cover on every Department Bulletin, as some of them are too small to require it. If covers are used at all, they should be restricted to bulletins of 50 or 60 pages and then only when they contain numerous plate illustrations or folded maps. The saving effected by the omission of covers is estimated at \$1,500 per year, well worth taking into account.

Doctor Kellerman's suggestion for the establishment of a record room, where circular letters and other ephemeral publications would be preserved for reference, is worth considering. I may say, however, that copies of everything in the nature and size of a publication ever issued by the Department are preserved in two bound sets of Department publications now in the possession of this office. As we have no room in which they could be kept for convenient reference, I have recommended that they be turned over to the Librarian, when that official has the necessary space.

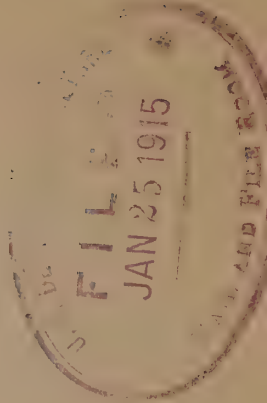
Very respectfully,

Jos. A. Arnold
Editor and Chief.

James H. King

S U M M A R Y .

INFORMATION ACQUIRED BY THE DEPARTMENT IS ISSUED IN
THE FOLLOWING FORMS:



1. Annual Reports:

- (a) of the Secretary. Edition 5,000 copies; distributed to the President, Members of the Cabinet, principal Government officials, and to Senators, Representatives, and Delegates in Congress, and to the public.
- (b) of Department. Part One includes the Secretary's Report, and Reports of the various Bureaus, Divisions, and Offices; the edition authorized by law is 6,000 copies, 3,000 for the Department of Agriculture, of which only 400 are usually ordered for distribution, principally to libraries.

Part Two, the Yearbook; the Department's allotment being 30,000 copies, distributed principally to correspondents of the Department, a limited number being available for distribution to miscellaneous applicants.
- (c) of Office of Experiment Stations. Edition authorized by law 8,000 copies, of which 3,000 are generally ordered for use of the Department, the distribution being principally upon the order of the Office of Experiment Stations.
- (d) of Field Operations of the Bureau of Soils. Edition authorized by law 10,500 copies, 6,000 being for the use of the Department, but of which only 1,000 copies have for several years been ordered and distributed, principally to libraries. The soil surveys which go to make up the full report are by law issued in advance, of each of which 1,000 copies can be and are ordered for the use of the Department.
- (e) of Chief of Weather Bureau. A quarto volume, of which 4,000 copies are authorized by law, 1,000 being for the use of the Department.

2. Department Bulletins,

- (a) Department Bulletins containing popular discussions of the investigations of the Department, the matter prepared in the different Bureaus, Divisions and Offices being published as contributions to the Department series. There is a sub-series of these bulletins known as Professional Papers, such bulletins being of particular interest to technical trades or industries. The editions are from 3,000 to 10,000, according to the character of the subject. Aside from the distribution to regular mailing lists, copies are sent to miscellaneous applicants as long as the supply lasts.

3. Serial Publications:

- (a) Experiment Station Record; issued in 12 numbers a year, each volume consisting of 12 numbers; edition 7,500 copies; not for general distribution.
- (b) Journal of Agricultural Research; issued monthly, contains purely scientific and technical articles; edition 3,000 copies. Separates of the articles are also issued. Neither the Journal nor the separates are for general distribution.
- (c) Weekly News Letter; four page quarto publication; the edition of 115,000 copies is distributed principally to crop correspondents, although copies are sent to miscellaneous applicants if requested.
- (d) The Monthly List of Publications, a four page octavo circular, giving a list and descriptions of publications issued during the month; edition 198,000 copies; sent to all who ask for it.
- (e) The Monthly Weather Review; a quarto volume of which 1,500 copies are issued monthly, 12 numbers comprising a volume. Limited free distribution.
- (f) National Weather Bulletin; issued weekly during the growing season and monthly during the Winter months of the year. It is a quarto publication averaging 2,700 copies to each edition.

(g) The Climatological Bulletin; a quarto publication, issued monthly, the average edition being 750 copies.

(h) The Agricultural Outlook; issued monthly in the Farmers' Bulletin series; contains reports of conditions of crops, yields, etc., also reports of acreage, production and value of crops, as well as brief miscellaneous articles. The edition is 225,000 copies, which are for free distribution.

(i) Service and Regulatory Announcements; issued by each Bureau interested in the enforcement of the regulatory Acts, each month or more or less frequently, as the material warrants; printed in octavo size; editions varying from 1,000 to 10,000 copies, distributed principally to interested persons.

4. Reports of the Secretary's Office:

(a) This series recently revived and to include manuscripts which do not seem suited for publication in any other series.

5. Manuals, Directories, and Other Administrative Circulars:

(a) These include instructions intended primarily for Bureau Division and Office employees; they do not appear periodically and are not for general distribution.

6. Separates, Leaflets, and Unnumbered Circulars:

(a) The separates include articles from the Yearbook, Field Operations of the Bureau of Soils, Annual Reports of the Department, and Journal of Agricultural Research. The use of the separate articles serves a useful purpose and makes it unnecessary often to distribute the full reports where applicants desire only one article therein. The editions are usually large and distributed free.

(b) The unnumbered circulars are generally very brief; are for office use or for special distribution in restricted areas; they are not considered of sufficient importance to be designated as publications.

7. Farmers' Bulletins:

- (a) This series consists of practical, concise instructions relating to farm operations; varies in size from 16 to 20 pages. There is a special appropriation of \$137,500 for printing these bulletins, four-fifths of which are sent out upon the orders of Senators, Representatives, and Delegates in Congress. Last year the total number printed was 14,900,000.

8. Press Notices:

- (a) The Office of Information prepares press notices, which contain popular statements of the work of the Department. They are duplicated on flexotype machines in this Division and issued in lots of 250 to several thousand.

9. Other Flexotype Work:

Frequently information prepared in different Bureaus, Divisions and Offices is duplicated by means of the flexotype machines in this Division, such material being generally used in correspondence, though occasionally a pamphlet is printed, as for instance "Plant Immigrants," by the Bureau of Plant Industry, which contains descriptive notices of newly introduced plants.

Department and makes recommendations and suggestions as to proposed activities. It is paper bound and the edition is fixed by law at 5,000 copies.

The Annual Reports of the Department of Agriculture, known as Part One of the Annual Report, contain the Report of the Secretary to the President and the Annual Reports of the Chiefs of the different Bureaus and Divisions made to the Secretary. Under the law 6,000 copies of this Report may be printed, 1,000 for the Senate, 2,000 for the House of Representatives, and 3,000 for the Department of Agriculture. The volume varies in size, containing from 350 pages up, and is bound in black cloth. A few copies are allotted to each Bureau. It is not suited for general distribution and the Department orders only 400 copies.

The Yearbook is Part Two of the Annual Report of the Secretary and is required by law to contain reports from the different Bureaus and papers prepared by special agents, suitably illustrated and specially suited to interest and instruct the farmers of the country, as well as a general report of the operations of the Department for the information of the farmer. Of this volume 30,000 copies, bound in blue cloth, are prepared for the Department, 110,000 copies for the Senate, and 560,000 copies for the House of Representatives. The Department's allotment costs about \$15,000, and copies are distributed principally to correspondents.

The Annual Report of the Office of Experiment Stations includes the report of the work and expenditures of the Office of Experiment Stations, established by Act of Congress, and the Department's relation with each State Agricultural Experiment Station. It is a volume of approximately 500 or more octavo pages, of which 8,000 copies may be printed,

1,000 for the use of the Senate, 2,000 for the use of the House of Representatives, and 5,000 for the use of the Department of Agriculture. Only 3,000 copies are usually ordered and they are distributed principally upon the order of the Office of Experiment Stations.

The Field Operations of the Bureau of Soils contains a general review of the soil survey work of the Department and a copy of each soil survey completed during the year. It is an octavo volume, the last volume of which contained 2,356 pages, comprising soil surveys or reconnaissances conducted in 25 states. Under a provision of law 10,500 copies may be printed, of which 1,500 are for the Senate, 3,000 for the House of Representatives, and 6,000 for the use of the Department, but only 1,000 copies are ordered, principally for libraries. The law further provides that as soon as manuscripts can be prepared with the necessary maps and illustrations, a report on each area covered, in the form of advance sheets bound in paper covers, shall be issued, of which 500 copies shall be for the use of each Senator in the state in which the survey is located, 2,000 for the use of the Representative of the Congressional District, and 1,000 copies for the use of the Department of Agriculture.

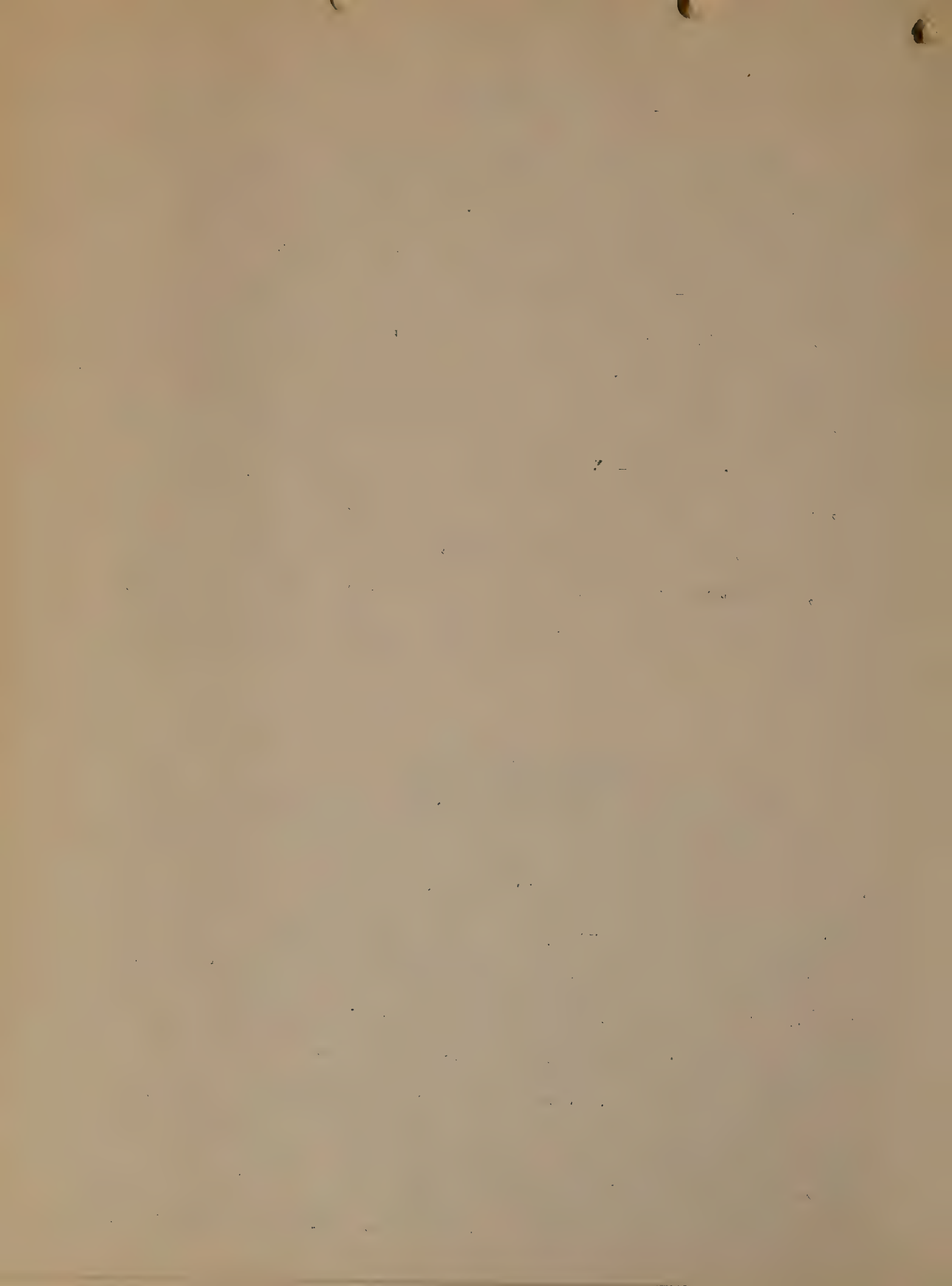
The Annual Report of the Chief of the Weather Bureau, a quarto volume of several hundred pages, contains the administrative report, the general summary of weather conditions and monthly and annual summaries of climatological observations. Under the Act providing for public printing and distribution of public documents, 1,000 copies of this report are printed for the Senate, 2,000 for the House, and 1,000 for the Bureau, making a total of 4,000 copies.

DEPARTMENT BULLETINS.

The popular matter heretofore published in the bulletins and circulars of the Bureaus is now published in a Department series of bulletins, giving a popular discussion of the investigations of the Department. A sub-series of these bulletins, known as professional papers, is issued, containing reports of work of a professional or semi-professional nature, dealing with crops, animals and the products of the same, and material which, though sometimes handled in a popular way, may be presented in technical or professional form. These are octavo in size, illustrated either by plates or text figures, or both, without cover or title page, table of contents or index, and are issued in editions of from 2,500 to many thousands, according to the character of the subject, the nature of the demand and the need for the wide dissemination of the information.

SERIAL PUBLICATIONS.

The Journal of Agricultural Research. The scientific and technical articles, heretofore issued as bulletins of the various Bureaus, are now published in the Journal of Agricultural Research, or as monographic supplements of that Journal. These consist only of reports of investigations which are new and directly or indirectly useful to the art of agriculture; they are concise, not generally occupying more than 10 or 12 pages, and are prepared by the scientists of the Department. Both the Journal and the monographic supplements of the same are royal octavo in size, in order to give greater freedom to the use of diagrams and technical illustrations, and contain text figures and full page plates. Each article appearing in the Journal is also issued as a separate, appearing and distributed



at the same time as the issue of the Journal containing it. The Journal appears monthly, 12 numbers constituting a volume, and is distributed free only to agricultural colleges, technical schools, experiment stations, the libraries of State Universities and Government depositories, and such institutions as make suitable exchanges with the Department. The Superintendent of Documents has established a price for the individual copies and he receives subscriptions for the complete volume at \$2.50 per year, so that while the separates are distributed with great freedom to persons interested in the particular subject treated, the entire number, or volume for the whole year, can be secured at a nominal price by those who, while not on the Department's free distribution list, may have a desire to obtain copies. Each number contains somewhat less than 100 pages and is issued in an edition of 3,000.

The Experiment Station Record, formerly a periodical of 12 numbers forming a volume annually has grown to a serial of two volumes to the year, each volume containing 10 numbers and each number a full 100 octavo pages of text, in addition to the title page, table of contents, list of illustrations, etc. The Record presents each month abstracts of and comments on the scientific literature bearing upon agriculture issued by agricultural experiment stations and other institutions, either at home or abroad. It is distributed free only to those who are actively engaged in scientific investigations of agricultural subjects, libraries of experiment stations, agricultural colleges, and large public libraries at home and abroad, and to such exchanges with which the Department has mutual relations and cooperation. The edition is limited to 7,500 copies and the Superintendent of Documents receives subscriptions at \$1.00 a volume.

The Weekly News Letter. Each week the Department issues a Weekly News Letter to Crop Correspondents. This is a four page quarto publication. and the edition of 115,000 copies is distributed through the mail seven days before the date of issue and is available in all parts of the country for notice and reprinting in the rural newspapers by the date of regular issue. The letter contains an effective summary of the most important work, discoveries, and investigations of all the Bureaus and Divisions each week and is sent to all correspondents of the Department located in the United States.

The Monthly List of Publications. Shortly after the first of each month the Department issues a monthly list of publications, containing a statement as to the pamphlets printed during the preceding month, giving the title, author, number of pages, plates and figures, and the price at which it can be obtained from the Superintendent of Documents, together with a short note describing the character of the bulletin and the section of the country to which it is specially applicable. Of this list 198,000 copies are issued and distributed gratis monthly, the object being to place it in the hands of anyone sufficiently interested in the Department's publications to make request to be included in this service.

The Monthly Weather Review is a quarto volume varying in number of pages, of which 1,500 are issued monthly, 12 numbers comprising a volume and each number of the volume being issued in the same calendar year.

National Weather Bulletin. This bulletin is issued weekly during the growing season and monthly during the Winter months of the year. It is a quarto averaging about 2,700 copies to each edition and gives information concerning the temperature, precipitation, and other weather conditions of the period of which it treats.

The Climatological Bulletin is a quarto issued monthly and comprising reports from each of the 12 Weather Bureau Districts. The number of copies of the individual articles vary, the average being about 750 copies.

The Agricultural Outlook. While not strictly a serial the Agricultural Outlook is one of the Farmers' Bulletin series, issued monthly during the season in lieu of the former Crop Reporter, and contains the crop reports of conditions, yields, etc., prepared in the Bureau of Crop Estimates.

Service and Regulatory Announcements are issued by each Bureau or Division, interested in the enforcement of the Regulatory Acts, each month or more or less frequently as the material warrants. They are printed in bulletin form and standard size and contain a complete periodic record of all regulatory matters, including text of published notices of judgments, text of decisions formal and informal, text of a digest of notices of hearings, quarantines and other orders, extracts from correspondence and such other information as establishes precedent or deals with service or regulatory matters of which the public should have notice. The edition of each of these octavo pamphlets varies from 1,000 to 10,000 copies.

NUMBERED SECRETARY'S REPORTS.

The numbered pamphlets in the series of Secretary's Reports have reached 100. When the change in the form of the Department's publications was made in July, 1913, this series was abandoned, but, experience having shown that there are manuscripts which should be published and distributed for the benefit of the scientific and rural population, the subjects of which do not fall readily in either of the established series, it was decid-

1. The first part of the document

describes the general situation

and the main objectives of the study.

The second part of the document

describes the methodology used

in the study and the results obtained.

The third part of the document

describes the conclusions of the study

and the recommendations for future research.

The fourth part of the document

describes the bibliography of the study.

The fifth part of the document

describes the appendix of the study.

The sixth part of the document

describes the index of the study.

The seventh part of the document

describes the list of figures of the study.

The eighth part of the document

describes the list of tables of the study.

The ninth part of the document

describes the list of references of the study.

The tenth part of the document

describes the list of abbreviations of the study.

The eleventh part of the document

describes the list of symbols of the study.

The twelfth part of the document

describes the list of acronyms of the study.

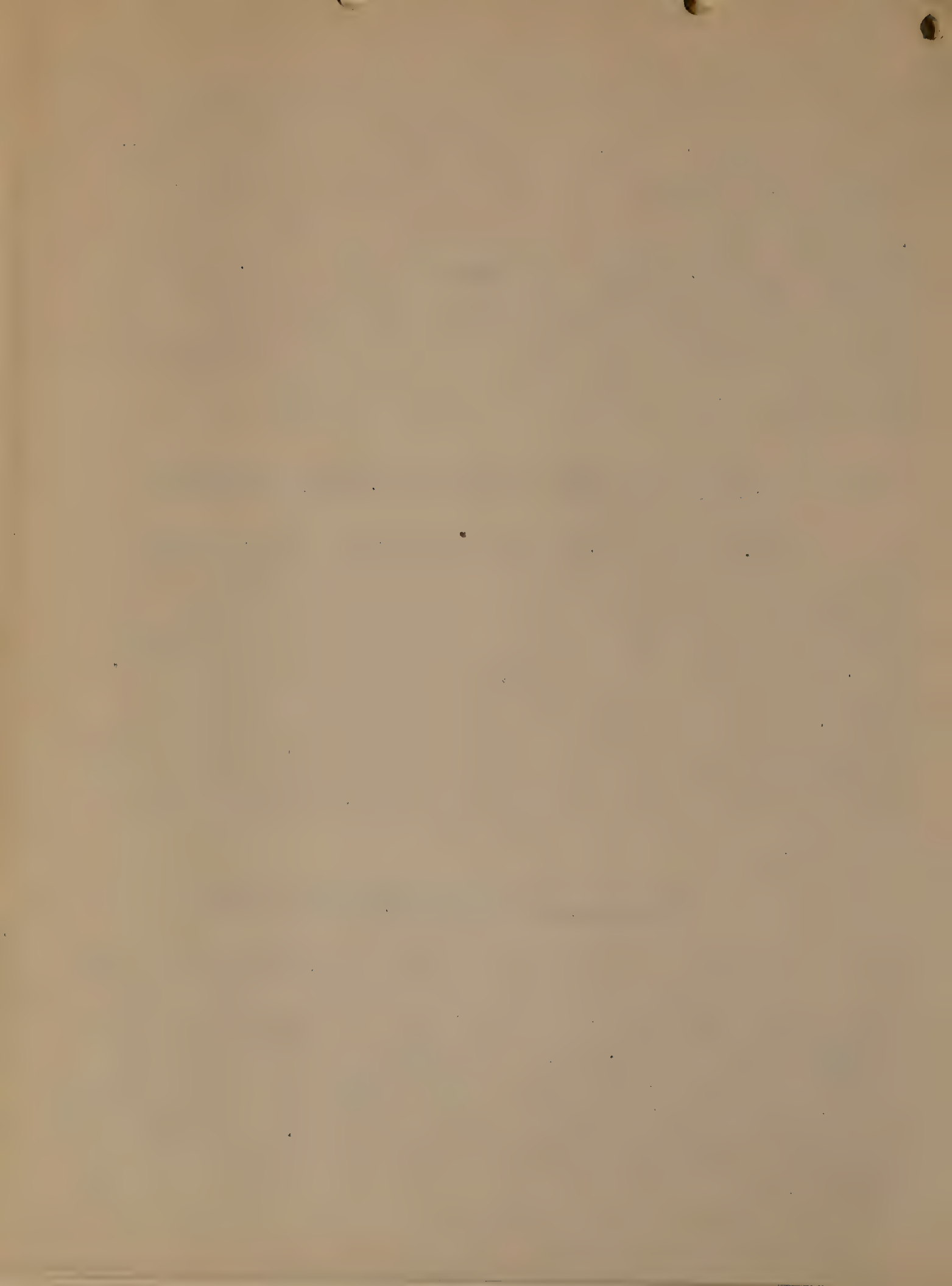
ed to revive this series on the 1st of July, 1914, and two of these reports have been prepared for printing and binding during the current fiscal year. They are of standard size and differ from the bulletins in that they are paper bound, have title page, table of contents, list of illustrations, and usually an alphabetical index. The pages are usually less than 100 and the edition of each, while being in the Secretary's discretion if not more than 100 pages, is limited to that believed to be sufficient for the Department's use in disseminating the information contained in the report.

MANUALS, DIRECTORIES, AND OTHER ADMINISTRATIVE CIRCULARS.

These so-called manuals include instructions intended primarily for the Bureau employees, but are also available for distribution to other technical and professional men, who may have an interest in investigating or are familiar with the subject treated, but they are not issued in quantities sufficient for general distribution. They appear periodically, or when it is considered necessary to announce new or revised rulings and contain information as to the official acts required and decisions rendered under given circumstances.

SEPARATES, LEAFLETS, AND UNFOLDED CIRCULARS.

Separates are printed of articles from the Yearbook, the Field Operations of the Bureau of Soils, the Annual Reports of the Department, and the Journal of Agricultural Research. These being prepared from the original plates, it is possible, at reasonable cost, to supply copies for wider distribution than it would be possible to give to the volume or number from which they are taken.



The leaflets contain instructions of minor character, particularly how to plant and cultivate certain seeds or bulbs, with which they may be forwarded, or as to certain conditions arising to which it is desirable to secure the attention of the dwellers in any particular section of the country.

It has been found convenient to print certain manuscripts as unnumbered circulars. Even before the change in form of the Department's publications, unnumbered circulars were used, and though abandoned for awhile, several of the Bureaus have need of literature for the dissemination of the results of certain activities, when it is not deemed advisable to include the matter in either the Department bulletin series or that of the Farmers' Bulletins. They treat of minor subjects in a popular way, usually applicable to a restricted section, and can be readily produced in large numbers if desired. All of this class of publications are of standard size.

FARMERS' BULLETINS.

The series of Farmers' Bulletins consists of practical, concise, specific instructional statements on matters relating to country life and the average size of each bulletin is 16 pages, although when occasion requires the number of pages has been increased or lessened. The matters discussed in these bulletins are handled in such a way that the statements are practically in the nature of formulas and they are prepared as far as possible to apply to specific sections of the country and to be of such a literary form as to be attractive reading. There is a special appropriation of \$157,500 for Farmers' Bulletins, four-fifths of which, under the law, are distributed upon the orders of Senators, Representatives, and Delegates in Congress, to persons selected by them under addressed franking furnished by



them. During the past fiscal year practically half of the Department's publications in number were of this series, which has already reached to 625 different pamphlets. The total number issued last year was 14,900,000. From its quota the Department supplies miscellaneous applicants.

PRESS NOTICES.

The Office of Information, established about a year ago, issues press notices in order to secure the widest possible circulation for the discoveries and recommendations of the scientific specialists and field workers in the Department of Agriculture, securing the facts from printed bulletins and circulars, official reports or oral statements of the specialists, and giving accurate and popular statements of the work of the Department through the public press in a form that will attract the attention of the readers and lead them to adopt the methods recommended. These press notices are reproduced for distribution to the press on the flexotype machines in this Division, are from one to five, 9 x 12, typewritten pages, and are issued in lots of 250 to several thousand each, according as the subject may be of general or restricted interest.

Other flexotype work is shown in the pamphlet called "Plant Immigrants", which contains descriptive notices, furnished mainly by agricultural explorers and foreign correspondants, relative to such newly introduced plants as have arrived during each month, and distributed to lists of addresses maintained at the Office of Foreign Seed and Plant Introduction, Bureau of Plant Industry. Number 27 of this series was issued in May, 1914, and probably later numbers have appeared. The page is an 8 x 10 typewritten sheet and the different numbers have continuous pagination. Some of the copies have halftone plates from cuts furnished by the Department.

United States Department of Agriculture,

BUREAU OF PLANT INDUSTRY,

Office of Foreign Seed and Plant Introduction.

HOW TO SEND LIVING PLANT MATERIAL TO AMERICA.

By DAVID FAIRCHILD,

Agricultural Explorer in Charge of the Office of Foreign Seed and Plant Introduction.

INTRODUCTION.

The difficulties of sending living plants are generally exaggerated, while the dangers, on the other hand, are almost universally underestimated. Properly selected cuttings or scions of most of the common woody plants, if properly packed and kept at a temperature between 50° and 60° F. (10° and 15° C.), can be shipped halfway around the world. A single cutting infested by a scale insect or a parasitic fungous disease may infect a whole country and lead to the destruction of a great plant industry.

It is with the object of explaining how this introduction of new plant material should be done in order to avoid the dangers of introducing diseases and to insure the arrival of the material in a vigorous growing condition that this circular has been prepared.

The easiest and at the same time the safest way to send plant material is in the form of seeds, whenever these will reproduce the same variety as the mother plant from which they came. In general, the cultivated tree fruits and shrubs are the result of grafting, and plants grown from their seeds do not produce the same quality of fruit as the parent. This fact can generally be easily determined, for those who are growing the plants, even though they belong to savage tribes, know how the plants are reproduced. If the plants are wild, it is always safest to send their seeds if they can be secured. If not, the attempt should be made to send cuttings on the chance that they may succeed.

SEEDS: THEIR PREPARATION FOR SHIPMENT.

Seeds should be fully *ripe* when collected. They should be *pure* seeds, i. e., *not mixed with other seeds*. It is, of course, sometimes impracticable to clean seeds in the field, and the correspondent will have to depend upon the seed-cleaning apparatus of the Department of Agriculture to remove all weed seeds when the shipments arrive. Seeds should be *dry*, but *not dried in bright sunlight*—rather by being spread out in the shade.

Seeds vary enormously in their vitality. Some seeds die in a few days if dried out, while wheat and other grains retain their vitality for 20 years or even longer—not, as sometimes reported, for centuries. In general, small-sized seeds with hard or dry shells, such as grass seeds and grains, melon seeds, and vegetable seeds, can be successfully shipped dry in sacks or envelopes. (Pl. I.) Large nuts, particularly chestnuts or acorns, and palm seeds or seeds of fruit trees—in fact, any large *tree seeds with oily kernels*—should be packed in *slightly moistened charcoal*, preferably charcoal which has been washed to remove the creosote (Pl. I). Sphagnum moss which is

barely moist may also be used for this purpose. For some very short-lived seeds, like mango and mangosteen seeds, a slightly moistened mixture of half charcoal and half chopped sphagnum moss has been very successful.

Seeds taken from fruits should be thoroughly washed and cleaned of fruit pulp and dried in the shade before packing in charcoal, as the chief danger in the shipping of such seeds is from molds which get started in the bits of decaying pulp attached to the seeds and grow into the living seeds themselves.

If all the packing material is first washed in 2 per cent formalin and then thoroughly washed in boiled water, the chances of molds injuring the seeds seem to be lessened.

CUTTINGS OR SCIONS: THEIR PREPARATION FOR SHIPMENT.

It is not always easy to find out except by experiment whether a small piece of a plant when put in *sand* water will form roots and grow or whether it must be grafted on some other rooted plant. If it roots, it is called a cutting; if it has to be grafted by any of the many ways of graftage, it is called a scion. Cuttings and scions should be selected with great care. They should be branches of the plant which have made a vigorous, clean growth. (Pl. II.) The buds should be well formed. Every cutting should be inspected, to make sure that no scale insects or disease spots are on it, and only those sent that have clean, healthy bark. The diameter of the cutting to select varies greatly, depending upon the species, as illustrated in Plate II. Large cuttings carry better than small, slender ones. In general (there are many exceptions), a cutting or scion should be taken from that part of the branch which has finished its first season's growth and is not yet 2 years old. After the leaves fall is the best time to take cuttings of deciduous trees and shrubs—hardwood cuttings. Cuttings of soft-wooded plants, such as geraniums, are somewhat more difficult to send long distances, as they are likely to decay. They often arrive, however, in good condition. These cuttings can be taken at almost any time, but it is important that they have the proper texture or age. If upon being bent the shoot snaps off squarely, so as to hang together with only a bit of bark, it is in the proper condition for cuttings, but if it bends or simply crushes it is either too old or too young. Scions of the orange or plants with evergreen leaves can be taken at any time of year and the leaves cut off as shown in Plate II.

Many methods, some of them very complicated, of packing scions or cuttings have been experimented with, but the simple one described photographically in Plate III has yielded as good results as any yet tried, although our

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agricultural explorers, who send in large quantities of material, often abandon the use of tin tubes and sew up their bundles of scions in strong cotton cloth, after wrapping them in moist sphagnum and oiled paper, thus saving expense in postage. In using the mailing tins which are sent out from the Office of Foreign Seed and Plant Introduction, the method illustrated progressively by figures 1 to 10 of Plate III is advised.

DIRECTIONS FOR USING MAILING TINS.

Take the tin out of its mailing sack, open it, and remove the dry sphagnum moss. Fill the cap with water up to the small hole in it and sprinkle this amount of water over the moss. *Mix the moss thoroughly with the hands until it is all of the same degree of dampness. Do not add more water or moss.* Spread this out carefully at one corner of the waxed paper which you will find in the tin, lay the cuttings or scions, from three to six, depending upon the size, on the moss, covering them lightly with it. Fold the corner of the paper down and then roll the cuttings and moss in the paper just tightly enough so that the roll will go in the tin, folding the side corners of the paper in under the roll, as shown in Plate III, figures 5, 6, and 7. Write the name of the plant, its variety name, the date, and the locality where collected on a slip of paper and put it in the roll. Put this roll into the tin, place the cap on, and put the tin in its sack.

Paste the necessary postage stamps on the tag which accompanies each tin. The tin when packed must not exceed 12 ounces, or 350 grams, in weight, and the rate of postage is about equivalent to 1 cent in foreign money per ounce (29 grams) or fraction thereof. Write the name and address of the sender on each tag, in order to identify the shipment when it arrives in Washington. Arrange, if possible, to keep the tins cool in transit on board steamer.

ROOTED PLANTS: PREPARATION FOR SHIPMENT.

While small rooted plants may be shipped short distances in mailing tins if their roots are wrapped in moss and their tops left uncovered, in general rooted plants which will stand an ocean voyage are too large to send by sample post and must be forwarded by parcel post, express, or freight.

To prepare these plants for shipment, they should be carefully dug without injuring the many fine, fibrous roots. A small ball of earth should be left around the roots if the plant is an evergreen one, but from the roots of trees which drop their leaves in autumn (deciduous trees) it is better to shake out the unnecessary soil and pack the roots carefully in moist sphagnum moss, tying this moss securely around them with twine. The tops should not be wrapped, except for frost protection when shipped in freezing weather. Several individual plants, each carefully prepared, can be packed in a well-ventilated box, the important point being to *fasten each plant securely in the box* so that it can not tumble around in it, no matter on which side the box is laid. (Pl. IV.)

By placing balled plants so that their roots are toward the ends and their tops together in the center of the box, the foliage of evergreen plants can be given more

air and thus be prevented from falling off. By alternating the tops and roots much space can be saved, and this can be safely done with plants which have no leaves on them.

The ventilation of a box of plants is important, and in general several 1-inch holes, bored in the region where the tops of the plants are located, afford sufficient ventilation if they are on all four sides of the box. *Every hole in a box of plants should be covered with a piece of wire screen to prevent rats and mice from getting into the box while it is on board ship.*

It is of the utmost importance that plant shipments be kept cool in transit, and wherever possible arrangements should be made with the purser of the steamer which carries them to have the box put in what is known as the cool room (not the cold-storage room), where a temperature between 35° and 50° F. is maintained. The optimum temperature is about 50° F.

WARDIAN-CASE SHIPMENT OF TROPICAL PLANTS.

In shipping tender tropical plants long distances it is generally necessary to send them in what is known as a Wardian case, a kind of portable greenhouse. (Pls. V and VI.) A strong wooden box is made, with an extra-strong bottom raised off the ground on short legs and having handles at each end. The sloping roof is composed of two glazed sashes, one of which is hinged at the ridge pole, so it can be raised like a box lid. The glass is protected by strong slats, and ventilation is provided by two small holes, one at each end of the box near the ridge pole. These holes are covered with wire netting. *Wardian cases must be carried on the deck of the steamer in order to give the plants light, but they should be placed under an awning and must be protected from salt spray and the salt water used in scrubbing down the deck, which are very injurious to foliage. The plants must be watered about once a week in transit, a thorough soaking with fresh water being sufficient. If packed around with damp coconut fiber, the plants will require less frequent watering.*

SHIPPING DIRECTIONS.

Sample-post shipments should be mailed direct to the *Office of Foreign Seed and Plant Introduction, Department of Agriculture, Washington, D. C., United States of America.*

The rate in all countries in the Postal Union is the equivalent of 1 cent (5 centimes) per 2 ounces (57 grams) or fraction thereof. The rate to and from Australia and Central American and South American countries is generally double this sum. Packages must not be sealed.

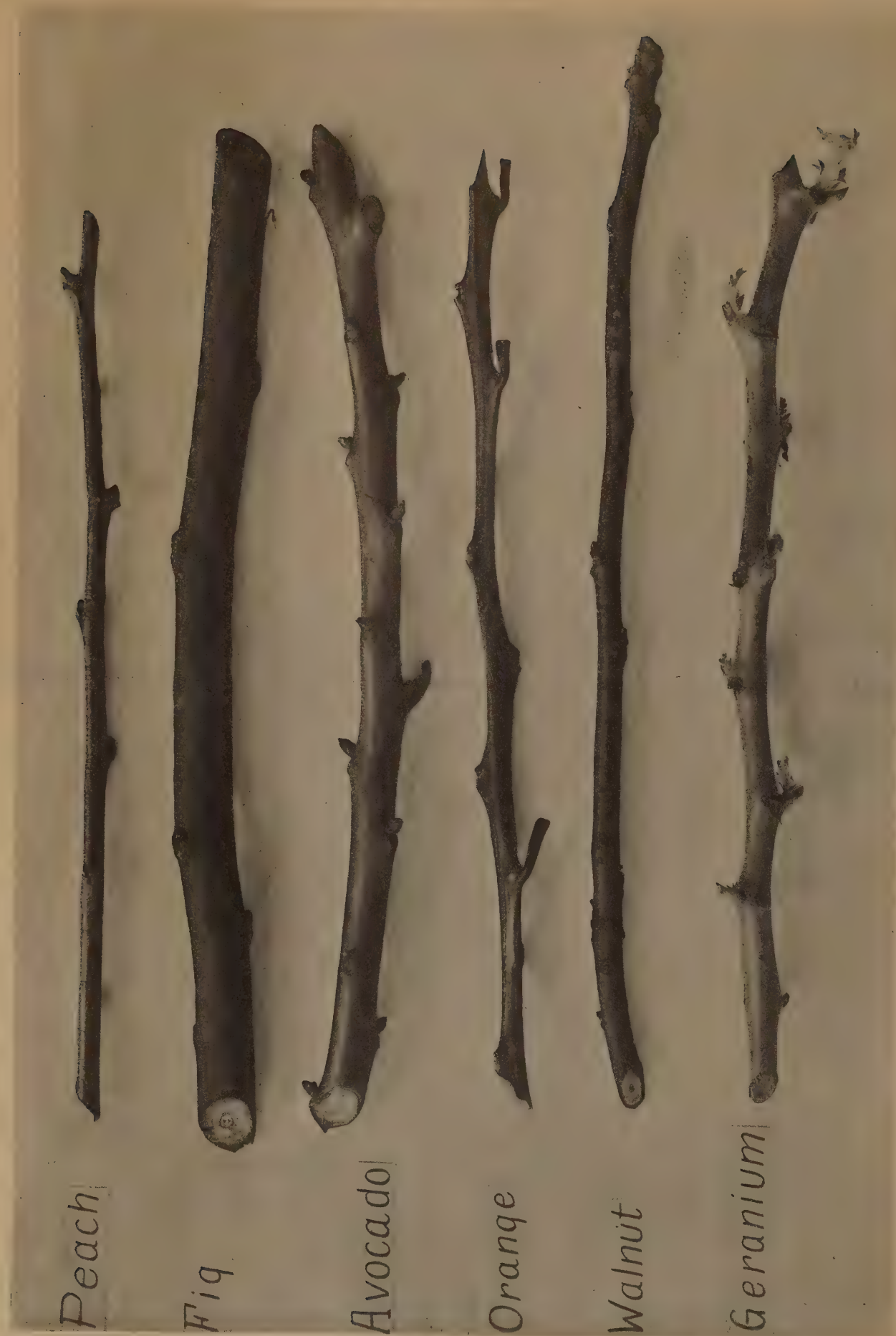
No writing except the name, the date, the locality, and the shipper's name is allowed in the package. It must not exceed 12 ounces (350 grams) in weight or the following dimensions: 30 by 20 by 10 centimeters (12 by 8 by 4 inches) except that when in the form of a roll it may measure not to exceed 30 by 14 centimeters (12 inches long by 6 inches in diameter).

Parcel post.—If too large for sample post, send, if possible, by parcel post, in care of the Government dispatch agent at New York, San Francisco, or Seattle. The



PACKAGES SHOWING METHODS OF PREPARING SEEDS FOR SHIPMENT BY SAMPLE AND PARCEL POST.

Short-lived seeds are packed in moistened charcoal or sphagnum moss, whereas grains and other long-lived seeds can be sent in seed packets, envelopes, or strong cloth sacks and these assembled in packages. (Examples of packages as received at Washington.)

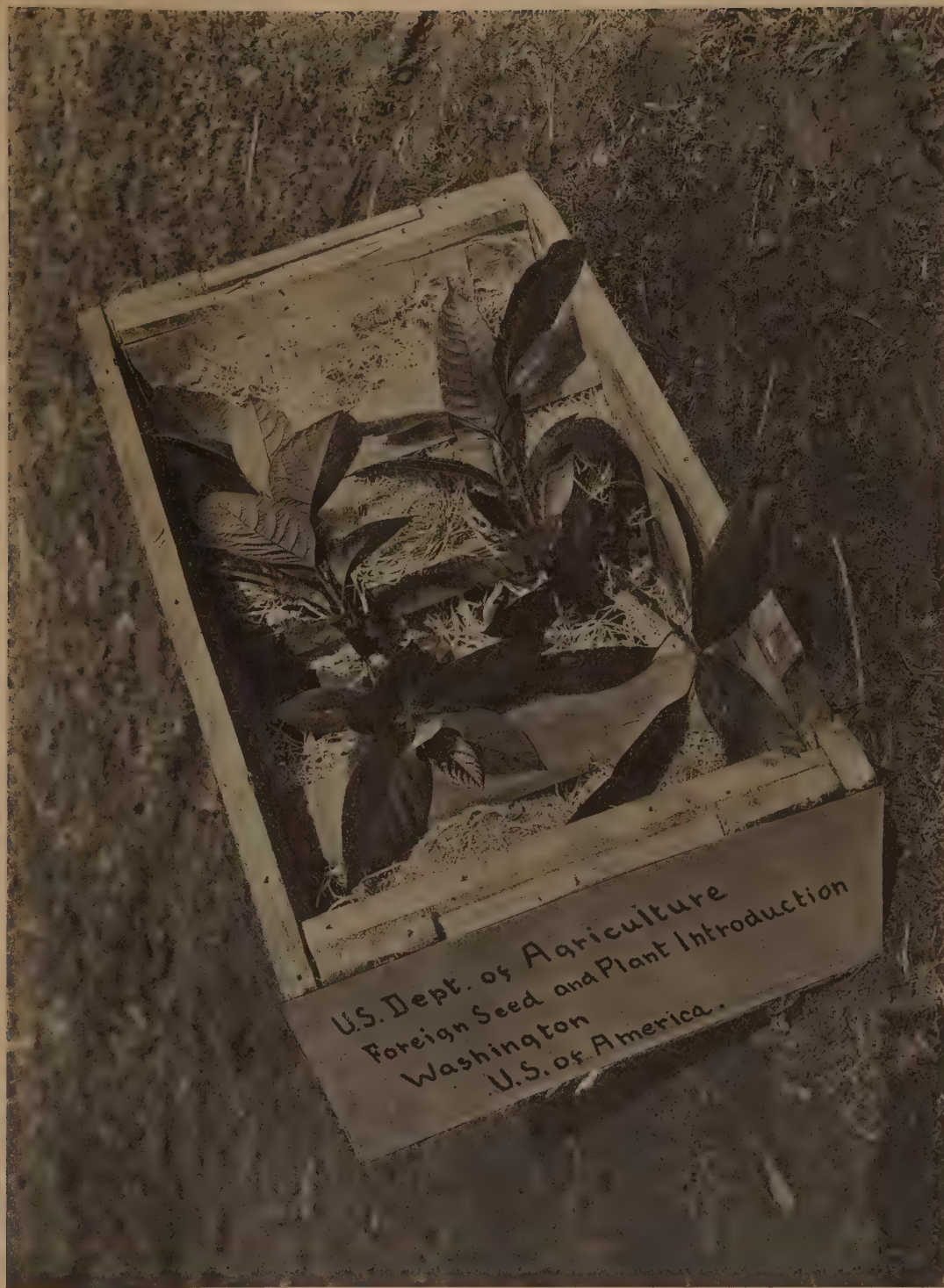


VARIOUS PLANT CUTTINGS OR SCIONS AS THEY SHOULD APPEAR WHEN CUT FOR SHIPMENT BY SAMPLE POST.
To carry well, the cuttings should not be smaller than those in the illustration, but rather larger.



HOW TO PACK PLANT CUTTINGS FOR THE SAMPLE POST.

Mailing tins, moss, and oiled paper are furnished to foreign correspondents and cooperators. Figures 1 to 10 show how the cuttings should be laid in the damp sphagnum, rolled up in the oiled paper, and inserted in the mailing tin. Wrapped in this same way and sewed up in cloth, cuttings may be sent without the tin.



LIVING PLANTS PACKED FOR SHIPMENT BY FREIGHT OR EXPRESS.

Each plant has its roots covered with sphagnum moss bound with twine. By means of cross pieces each plant is securely fastened in the box. The ventilation holes are all screened. Excelsior, burlap, or strong paper may be wrapped around the balls of moss to advantage. The roots of the plants should be packed at the ends of the box, their tops in the middle.



WARDIAN CASE OF LIVING TROPICAL PLANTS PACKED FOR A JOURNEY OF SEVERAL WEEKS' DURATION, WITH ROOF OR COVER IN PLACE, READY FOR SHIPMENT.

A 1-inch hole for ventilating purposes is bored through each end and screened with wire to keep out mice. Both covers, composing the roof, are of glass, protected from breaking by slats. The top board should not project at the ends as shown, as it is liable to be torn off.



WARDIAN CASE OF LIVING TROPICAL PLANTS PACKED FOR A JOURNEY OF SEVERAL WEEKS' DURATION, BROKEN OPEN TO SHOW CONSTRUCTION.

Each plant must be securely fastened in the case by means of cross slats. This case should be carried on deck in a light but not sunny situation, sheltered from salt spray as much as possible. The plants require watering once a week. One plant is shown out of the case in order to illustrate the method of wrapping the ball with excelsior.



HAND WARDIAN CASE OF LIVING TROPICAL PLANTS PACKED FOR A JOURNEY OF SEVERAL WEEKS' DURATION.

Each plant must be securely fastened in the case by means of cross slats. Ventilators, in this case large ones, must be screened, and the glass roof must be protected from breaking by slats or heavy wire. This case should be carried on deck in a light but not sunny situation, sheltered from salt spray and from salt water used in scrubbing down the deck. The plants require watering once a week.

agent should be notified. If from a country with which the United States does not have a parcel-post agreement, send to the United States Government dispatch agent, 4 Trafalgar Square, London, England. He will forward.

A parcel for the parcel post must not exceed 11 pounds in weight in any foreign country. The greatest allowable length varies from 2 feet to 3½ feet in different countries, while the greatest girth is 4 feet and the greatest length and girth combined is 6 feet.

Parcels sent by parcel post must not be sealed or contain any writing except plant names, locality, date of collection, and name of collector.

Freight or express.—Do not make a freight or express shipment without first writing to the Office of Foreign Seed and Plant Introduction to inquire whether we wish to bear the expense or not. Below is given a list of official dispatch agents through whom shipments may be made. In addition to this, the American consuls in all foreign countries are authorized to act as our agents. The official dispatch agents should always be notified beforehand of shipments made through them, and copies of shipping documents should be sent to them as well as to Washington.

Labels on shipments should bear the words "Foreign Seed and Plant Introduction, United States Department of Agriculture," to enable the dispatch agents to identify them.

London, England. C. J. Petherick, Deputy U. S. Dispatch Agent, 4 Trafalgar Square, London, England.

New York. I. P. Roosa, U. S. Dispatch Agent, 2 Rector Street, New York, U. S. A.

San Francisco. Dr. H. H. Hicks, 411 Post Office Building, San Francisco, Cal., U. S. A.
Seattle. Dr. Jens Madsen, 602 Central Building, Seattle, Wash., U. S. A.

QUARANTINE REGULATIONS.

All postmasters in the Postal Union have been advised from the headquarters in Berne that the circular of May 5, 1913, No. 2251/18, will not apply to plants or plant products addressed to the United States Department of Agriculture, Washington, D. C., and they should receive for shipment to America all experimental plant shipments which are addressed to the United States Department of Agriculture, Washington, D. C. In this, they are complying with the American quarantine act, which provides for quarantine inspection in Washington of all official plant shipments.

DESCRIPTIONS AND PHOTOGRAPHS.

Every plant introduction which is made by any individual through the Government is recorded in printed form, and the description which is given by the sender is published as a historical record. It is of the greatest importance that these records should give as full details as possible regarding each new plant immigrant. All friends of plant introduction, all over the world, are urged, therefore, whenever they send in plant material to write a full description of what they are sending and accompany it with photographs whenever possible. This will insure due credit being given by the public to the introducer in later years should the introduction prove to be a valuable addition to the useful plants of this country.

PLANT IMMIGRANTS

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Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to such newly introduced plants as have arrived during the month at the Office of Foreign Seed and Plant Introduction, of the Bureau of Plant Industry, of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 97.

May 1914.

Genera Represented in This Number.

Amygdalus	38178	Paeonia	38339-340
Catalpa	38254	Paulownia	38184
Citrus	38101	Punica	38185
	38293	Pyrus	38240-242
	38335		38262-271
Crataegus	38176		38277-278
	38283-284	Rollinia	38171
Euonymus	38237	Rosa	38161-166
Hypericum	38153	Saccharum	38257
Inocarpus	38135		38332
Malus	38231	Salix	38233
	38279	Zinziber	38180
Mimusops	38172	Ziziphus	38244-247
Olea	38336		38249-253
Oryza	38327		38258-261
Osterdamia	38177		

Plates: Large-sized Chinese jujubes.
Chinese Haw orchard and fruits.
Fei peach orchard.

(NOTE: Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.)

One of the main objects of the Office of Foreign seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders or others interested.)

Matter in these multigraphed sheets must not be published without special permission.

Amygdalus persica. (Amygdalaceae.) 38178. Cuttings and plants of the Fei peach from Feitcheng, Shantung, China. "A remarkable variety of clingstone peach, considered to be the best in all China. Size large to very large; shape round, very heavy, often over one pound apiece; skin quite downy and of pale yellowish color with a slight blush on one side. Flesh very juicy and sweet and of excellent aromatic flavor, of white color, except near the stone where it is reddish. Stone very large and pointed, flesh strongly adhering to it. Ripens in early to middle October and possesses excellent shipping and keeping qualities. The trees are of erect growth when young, but when older they spread out considerably, remaining of open growth. To reach their greatest perfection these peaches need to be fertilized each spring, while during dry seasons, they are irrigated from wells. The fruit is also thinned. The soil they seem to thrive in best is a porous, light clayey loam of reddish color, retaining moisture quite well, but not becoming too soggy. The local people calculate that on an average a tree supplies ten dollars Mexican worth of fruit each season and they consider an orchard of these peaches a very valuable asset indeed. The climate around Feitcheng is of a semi-arid nature and this variety of peach may be expected to thrive especially well in the regions west of the Rocky Mountains. Chinese name, 'Fei tao,' meaning 'Fei peach.' (Meyer's introduction.)

Amygdalus persica. (Amygdalaceae.) 38272-276. Peach cuttings from near Tai an fu, Shantung, China. Five varieties, one said to be very large and juicy, weighing up to a pound, and keeping to December, another of medium size, ripening late, and keeping well, a third very ornamental flowering variety, with small, peculiarly-shaped 3-pointed, rosy-red fruits, and two of the 'pien tao' or flat varieties, of good quality. (Meyer's introduction.)

Catalpa bungei. (Bignoniaceae.) 38254. Trees of catalpa from near the village of Wang yu ko, Shansi, China. "A quickly growing Chinese timber tree, growing to large size, specimens seen 100 feet tall, with trunks 10-15 feet in diameter a few feet above the ground. The Chinese plant this tree for its wood, which is strong, light, durable and non-warping. It resembles walnut to a considerable extent and is much in demand for table tops and for fine furniture. This tree might possibly be profitably cultivated in the semi-arid sections of the United States where the winters are not too severe, while the summers may be quite hot. They are easily propagated from

roots that are close to the surface of the ground and the tree thrives best when planted close to irrigation canals and on sheltered places. Chinese name 'Tchui shu', meaning 'autumn tree.' (Meyer's introduction.)

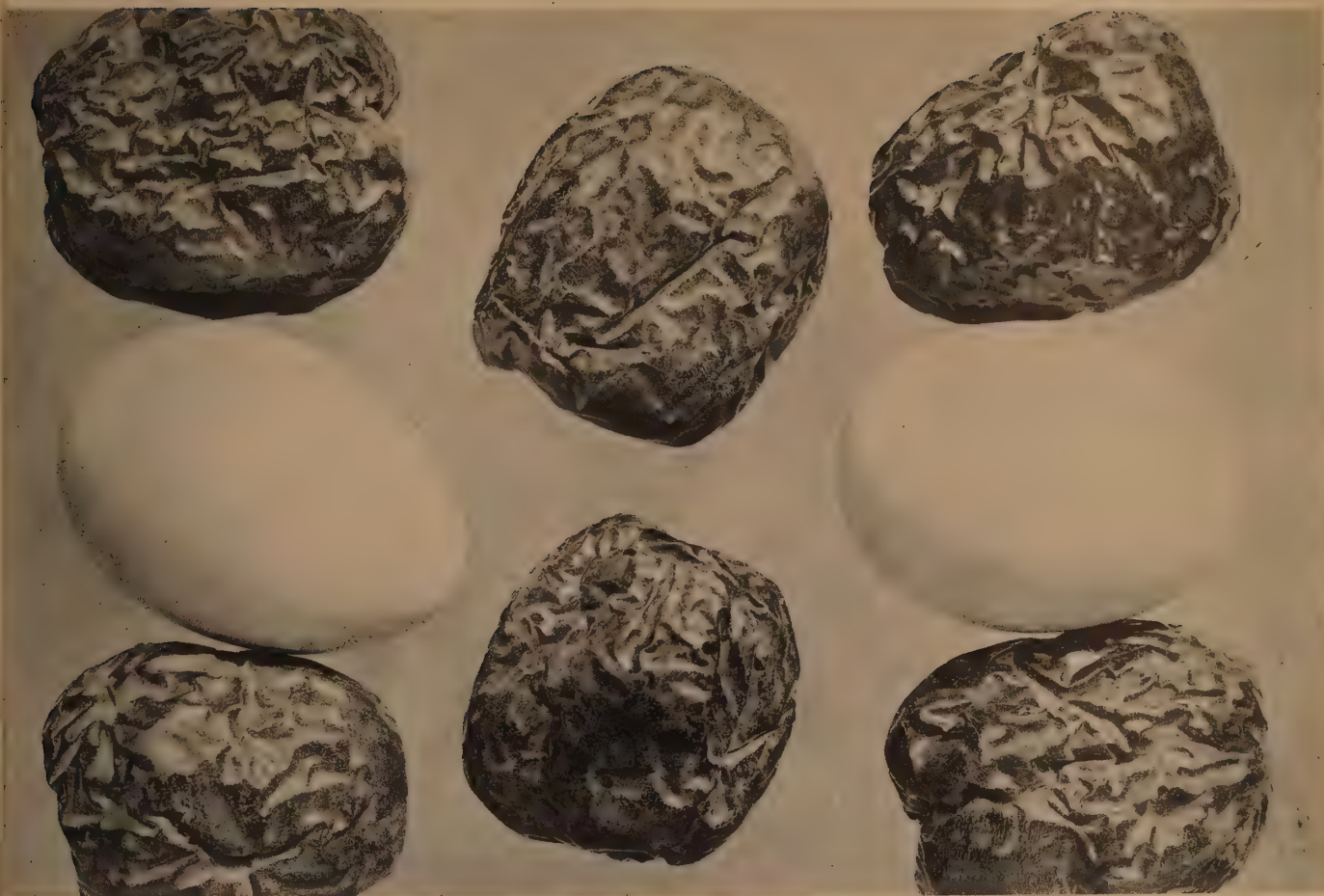
Citrus nobilis deliciosa. (Rutaceae.) 38101. Seeds of a mandarin orange from Lamac, Bataan, Philippine Islands. Presented by Mr. P. J. Wester, Horticulturist in charge of Lamac Experiment Station. "Seeds of a small, oblate, very thin skinned mandarin of most excellent quality, that is imported from China in considerable quantities. It is to my mind greatly superior to all the mandarins I have eaten here or in Florida with the possible exception of the 'Oneco', which it very much resembles in flavor. Considering how well the mandarin reproduces itself from seed, at least a few seedlings of excellent quality should be obtained from these seed." (Wester.)

Citrus hystrix. (Rutaceae.) 38293. Seeds of the cabuyao from Lamac, Bataan, Philippine Islands. Presented by Mr. P. J. Wester, Horticulturist in charge, Lamac Experiment Station. "A thorny tree from 6 to 12 meters in height with a rather dense rounded head, frequently with drooping branches; young growth more or less purplish, smooth. Leaves 16-24 cm. (6-10 in.) long, broadly winged, the area of the wings frequently exceeding the leaf area; fruit variable, from oblate to pyriform turbinate or oblong, smooth, to more or less corrugate, greenish lemon yellow; rind medium thick, flesh greenish, juicy, sharply acid, aromatic, contained in 12 to 15 locules; juice-sacs short and blunt; seeds many, flat, reticulate. Range from Malaysia including the Philippines to India. Like all other Philippine citrus fruits, the cabuyao goes under a multiplicity of names, varying with the tribal languages of the archipelago and the different forms of the fruit; some of these names are Suha, Balincolong, Biasong, Tibulit, Colobot, etc. Excepting the citron the cabuyao is perhaps less esteemed than any of the better-known citrus fruits in the Philippines and can scarcely be said to be cultivated. Some kinds are eaten with fish by the Filipinos and make a fairly good 'ade'. Most forms are also used in cleaning clothes and as a hair wash. The cabuyao has scarcely been introduced beyond its native habitat and is seldom seen even in botanical collections. For attractive shapeliness certain forms of the cabuyao are surpassed by no other citrus fruit. Some of these forms unquestionably will be recognized as subspecies or possibly as separate species on closer study." (Wester, Bulletin No. 27, Citriculture in the Philippines.)

Citrus sp. (Rutaceae.) 38335. Seeds of the 'natsu mikan' from southern Kyushu, Japan. Presented by Mr. E. H. Wilson, collaborator of this Office. "During my recent trip to southern Kyushu I made a collection of the various citrus fruits cultivated there. Among these fruits is an orange which I am unfamiliar with. Its Japanese name is 'natsu mikan' and it is said to keep longer than any other variety and to be very sweet at midsummer. It is a light-skinned variety with rather pale flesh and the skin separates from the flesh as it does in the pomelo. The tree bears while still small and the fruit is decidedly handsome in appearance. In February and March it is still on the tree and the flavor is sour and very decidedly bitter. I shall test the fruit again at midsummer to find if it becomes distinctly sweet. Very likely this orange is well known to you but it occurs to me that sweet oranges at midsummer would find a ready market. If of any interest to you there would be no difficulty in securing a supply of seeds. I think growing plants could also be obtained. Apparently it is as hardy as the Navel orange." (Wilson.)

Crataegus pinnatifida. (Malaceae.) 38176, 38283-284. Cuttings and scions of a large-fruited haw from the village of Ta ching ko, near Tai an fu, Shantung, China. "The Chinese haw fruit seems to thrive best on well-drained semi-gravelly or sandy loam and the best quality of fruit is produced on trees that grow on mountain terraces. It is not unlikely to become a fruit of considerable importance in America, when once it has become known. The Chinese graft and bud this haw on wild and seedling stock of the same species, but experiments should be made to determine whether other species of *Crataegus* will also be suitable for stocks." (Meyer's introduction.) Three varieties, one of which, of agreeable sour taste, can be kept almost a year, and is excellent for jellies, compotes, cake fillings, etc.

Euonymus bungei. (Celastraceae.) 38237. Cuttings from the village of Tchang pai, Shensi, China. "A spindle-wood, usually seen as a shrub, but when not molested, growing to a medium sized tree. The plant is an excellent bank binder, throwing up suckers all around; it stands drought to a wonderful degree, while it resists alkali also to a certain degree. On most places this shrub is cut down every year, but this treatment seems to make it spread more. It deserves to be given a thorough test as a bank and soil binding plant, especially in the semi-arid parts of the United States." (Meyer's introduction.)



Ziziphus jujuba.

Dried Chinese Jujubes.

The large round jujube or *Ta-yuan-tsao* from Pai hsiang chen, Shansi Province, China. (Hens' Eggs for comparison). The Tsao or Chinese jujube has proven hardy in the latitude of Washington and has borne good fruit in Texas and California. The discovery by Frank N. Meyer and the successful importation of cuttings of this unusually large fruited variety, S.P.I. No. 38243, cannot fail to have an effect upon the spread of jujube culture in this country. Photograph by Meyer, Feb. 14, 1914.



Amygdalus persica.

The Fei Peach.

An orchard of the Fei peach at Feitcheng, Shantung Province, China. A thousand taels (\$700) worth of fruit was sold from this small orchard in the fall of 1913. It is one of the highest priced peaches in China retailing for 4-8¢ apiece. A seedling of this Fei peach was fruited last season at the Chico Field Station, but Mr. Meyer has now succeeded in importing fine cuttings and plants of this very large late clingstone variety which the Chinese rate so highly. Photograph by Frank N. Meyer, March 20, 1914.

Hypericum oblongifolium. (Hypericaceae.) 38153. Seeds of a St. John's wort from Ventimiglia, Italy. Presented by Dr. Alwin Berger, Curator, La Mortola Gardens. "A shrub, truly hardy in England, with evergreen foliage and large handsome yellow blossoms, which is a native of northern India, Nepal, and the Himalayas. It is found growing at elevations of from six to twelve thousand feet. It is a small rather compact shrub, with red-brown terete branches. The leaves of this species which are the largest of the genus, are dark green above, pale and glaucous beneath, and two to four inches in length, and evergreen." (Botanical magazine, pl. 4949.)

Inocarpus edulis. (Fabaceae.) 38135. Seeds of the Tahiti-chestnut from Pago Pago, American Samoa. Presented by Commander C. D. Stearns, Governor. "One of the most striking features of the forest. It bears a kidney-shaped fruit which is eaten cooked, when not quite ripe, and tastes much like a chestnut. The wood is of light color, straight, of fine texture, and very tough. It is used for burning lime in open kilns, the wood having the remarkable quality of burning readily when green. In some of the Pacific Islands the nuts are preserved in pits, like breadfruit, where they ferment. In Samoa it forms a staple food for several months of the year. The wood is perishable and of little economic value. The bark is astringent." (Stearns.)

Malus sp. (Malaceae.) 38231. Scions of a crab-apple from Sianfu, Shensi, China. "A flowering crab-apple, of low branching, wide spreading growth, said to bear masses of small, double flowers of rosy-red color. Obtained from the garden of the English Baptist Mission Hospital at Sianfu." (Meyer's introduction.)

Malus sp. (Malaceae.) 38279. Scions of an apple from the village of Fan dja tchwang, near Tai an fu, Shantung, China. "A variety of apple, said to be large, of red color; flesh firm and of sweet flavor. Chinese name 'Ta ping kuo', meaning 'large apple'. Apparently very drought-resistant, and possibly of value for the drier parts of the United States." (Meyer's introduction.)

Mimusops sp. (Sapotaceae.) 38172. Seeds from the Rio de Janeiro Botanic Garden. "A small, sapotaceous fruit from the Jardim Botânico. Tree about 20 feet high. Fruit oval, slightly under one inch in length, maroon in color. The flesh surrounding the single seed is whitish and of very pleasant flavor resembling that of the sapodilla. (Dorsett, Popenoe and Shamel introduction.)

Olea europea. (Oleaceae.) 38336. Cuttings of olive from Bermuda. Collected by Mr. Peter Bisset, of this Office. "Cuttings from an olive that fruits sparingly in Bermuda. For trial in Florida where soil and climatic conditions are similar and where the olive does not fruit." (Bisset.)

Oryza sativa. (Poaceae.) 38327. Seed of a rice from Dakhla Oasis, Western Egypt. Purchased from Sheikh Abu Bakr, through contract made by Prof. S. C. Mason, of this Bureau, on his visit to the Oasis in October 1913. "This rice is a variety grown in the Oases of Kharga and Dakhla, and regarded by the natives as quite distinct from the so-called valley rice which is used in reclaiming the salty lands in the delta of lower Egypt. Mr. Wright, manager of the Corporation of Western Egypt at Kharga, and Sheikh Abu Bakr, the chief man of Dakhla Oasis, both especially recommended this rice as being a valuable crop for reclaiming salty lands. They stated that it can be grown successfully on land quite too strong for barley. My idea in bringing this in was not that it would be of sufficient importance to use as a main crop on high priced irrigated lands, but that it should be given a test as a useful crop in reclaiming lands at present too salty for the growing of alfalfa and barley. There are considerable areas of land of this character in the Coachella valley accessible to a good flow of artesian water. In Dakhla the land is bordered up with quite high ridges, and the water kept almost continuously on the rice, it being essential, of course, that there be some wash or lower tract into which the surplus water can be thrown. My idea is that it is this excess of water that really does the chief work of improving the alkaline ground rather than the rice crop itself, but if a crop of rice can be raised toward the expense of reclaiming such land and bringing it into condition for usefulness with other crops, the rice certainly justifies itself." (Mason.)

Osterdamia sp. (Poaceae.) 38177. Cuttings of a grass from the mountains near Tai an fu, Shantung, China. "A grass of low growth and of spreading habit, thriving to perfection on thin decomposed rock soil, along mountain paths where much tramping over takes place; also found on inclines where the mat of roots prevents the soil from being washed out. Of decided value apparently as a bank, lawn and golf-course grass, especially for the drier parts of the United States." (Meyer's introduction.)

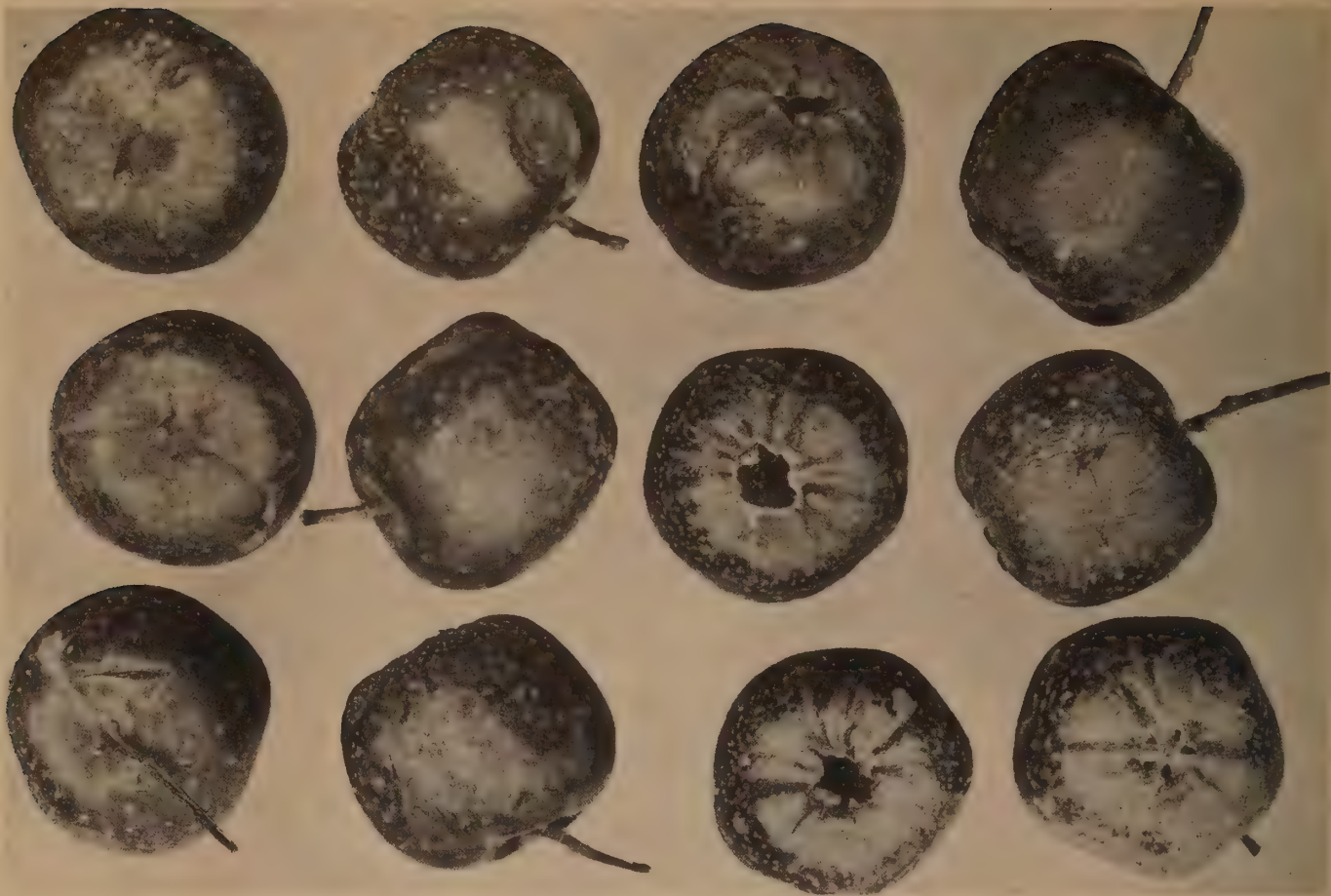
Paeonia albiflora. (Ranunculaceae.) 38339. Plants of herbaceous peonies from Tsaochou fu, Shantung, China. Among these are said to be yellow, green and black peonies. (Meyer's introduction.)



Crataegus pinnatifida.

Chinese Haw Orchard.

An orchard of Chinese Haw trees near Tai an fu, Shan-tung province, China. Trees of the Chinese haw which were grown from seeds sent in in 1906 by Mr. Frank N. Meyer are now growing in various localities in this country. As yet none of the imported varieties have fruited. The fact that good sized haw orchards are planted in China should encourage American horticulturists to study our own haw species and find out if they or the Chinese species are not worthy of orchard cultivation in this country. Photograph by F. N. Meyer, March 21, 1914.



Crataegus pinnatifida. Chinese Haw Fruits.

A superior variety of the large Chinese haw, from the markets of Tai-an-fu. They are there known as the large sour haw (*Ta suan tsa*). From these fruits (shown natural size) is made a marmalade which is eaten extensively in North China. Samples of this marmalade imported by Mr. Meyer indicate that it is of very good quality. Photograph by F. N. Meyer, March 20, 1914, Tai-an-fu, Shantung, China.

Paeonia moutan. (Ranunculaceae.) 38340. Plants of tree peonies from Tsaochou fu, Shantung, China. "Twelve rare varieties of tree peonies, among which are said to be yellow, blue, green, and black flowered ones. The soil best suited to these tree peonies is a loose porous, sandy loam, with perfect drainage and of great depth. In the district to the northwest of Tsao-chou one finds such soil and climatic conditions as seem to suit this peony to perfection and the plants are grown there on fields as regular crops and are sent all over eastern China, going as far south as Canton, and as far north as Mukden to be used mainly for forcing purposes. There are said to be more than 300 varieties in cultivation here. The best time for transplanting is considered to be September, while propagation is effected through division. The plants require three and one-half feet distance in all directions to develop to perfection, while older plants need even 4-6 feet distance apart. At the approach of winter these peonies are covered over with some soil, which is taken away again in early March. This saves the flower buds from being winter-killed and reduces danger of damage by men or beasts, as the wood of the tree peony is quite brittle. It is thought that possibly an industry could be established in some suitable section of the semi-arid southwestern United States, where the tree peony could be grown in large quantities, to supply florists with one of the most decorative flowers for winter forcing purposes." (Meyer's introduction.)

Paulownia fortunei? (Scrophulariaceae.) 38184. Root cuttings from the village of Chin kao tchien, Honan, China. "A paulownia, planted here and there on sandy lands as a soil binder and a windbreak. The wood is of a very light nature and is used in the construction of light furniture, playthings for children, bowls, jars, etc. Of value as a soil binder and an ornamental park tree, especially for the mild wintered sections of the United States." (Meyer's introduction.)

Punica granatum. (Punicaceae.) 38185. Cuttings of a pomegranate from Tsaochou fu, Shantung, China. "A pomegranate, producing very large double flowers of a brilliant red color. No fruits are set. Chinese name, 'Hswang sheh liu hua,' meaning 'Double flowered pomegranate.' Obtained from the garden of the Roman Catholic Mission." (Meyer's introduction.)

Pyrus sinensis. (Malaceae.) 38240-242, 38262-271, 38277-278. Cuttings of pears from Shansi, Honan, and Shantung, China. Fifteen varieties, some of which are remarkable for their keeping qualities, and others of very large size, all of probable value for breeding work. (Meyer's introduction.)

Rollinia orthopetala. (Annonaceae.) 38171. Seeds of the 'fruta de condessa' from Rio de Janeiro, Brazil. "The 'fruta de condessa' (Countess's fruit) indigenous in the state of Rio de Janeiro, from whence the fruit is shipped to the markets of the capital and sold there at 100 to 400 reis (4-14 cents) apiece. In general form the fruit is conical to cordate, frequently 3 to 4 inches in diameter. The surface is covered with conical protuberances of varying prominence, and is creamy yellow in color when the fruit is fully ripe. The skin is rather tough and not easily broken; it surrounds the milky white, somewhat mucilaginous flesh, in which the seeds are embedded. The flavor is somewhat insipid, but is evidently esteemed by the Brazilians as evidenced by the quantity of the fruit sold. The seeds are not as numerous as in many other annonaceous fruits, but are about the same size as those of the cherimoya. The fruit ripens in February and March in this region. Should be given a trial in Florida and southern California particularly as a stock for the cherimoya and other choice annonaceous fruits." (Dorsett, Pope-noe, and Shamel introduction.)

Rosa spp. (Rosaceae.) 38161-166. Seeds of roses from Ventimiglia, Italy. Presented by Dr. Alwin Berger, Curator, La Mortola Gardens. Six varieties of roses, as yet unidentified, from E. H. Wilson's collections in western China. Of probably value for rose breeders and for comparative tests.

Saccharum narenga? (Poaceae.) 38257, 38332. Cuttings of sugar cane from Honan, China. Two numbers, one a very hardy variety of low sugar content, the other a mixture of varieties, of higher sugar content. Recommended for trial for molasses production, and also for fodder for milch cattle. (Meyer's introduction.)

Salix sp. (Salicaceae.) 38233. Cuttings of a willow from the village of Tong dja pu, Shensi, China. "A willow, growing to be a tall tree, with a heavy trunk. The main branches are of erect growth and of dark green color, but the young twigs are slender and gracefully drooping and of a delicate yellowish color. A fine tree for parks, especially when planted in a clump or as solitary specimens, where they can be seen from some distance." (Meyer's introduction.)

Zinziber officinale. (Zinziberaceae.) 38180. Rhizomes of ginger from Feitcheng, Shantung, China. "A variety of ginger grown on sandy loam in the vicinity of Min yang to the south of Tai an fu. Much hawked about throughout Shan-

tung and retailing at from 10 to 12 cents Mexican per pound. It is much relished as a condiment in soups and with meat dishes and is considered to be very healthful, so much so in fact that Confucius advised his pupils to make ginger one of their relishes to be eaten daily. The Chinese plant the rhizomes as soon as the soil becomes warm and harvest the plants in the autumn after a light frost; the rhizomes are stored in cool dugouts and kept covered over with slightly moist sandy soil. Chinese name 'Hsien chiang', meaning 'Fresh ginger.'" (Meyer's introduction.)

Ziziphus jujuba. (Rhamnaceae.) 38244-247, 38249-253, 38258-261. Scions of jujubes from Shansi and Honan, China. Thirteen varieties, all from regions heretofore unexplored horticulturally, and one with fruits said to be larger than ordinary hen's eggs. Some varieties preferably eaten fresh, others when put up in weak brandy. (Meyer's introduction.)

NOTES FROM CORRESPONDENTS ABROAD.

Mr. O. F. Cook writes from Coban, Guatemala, May 20, 1914: "At last we have reached a place accessible to a post-office, and can begin sending a few things. As I feared the Florida trip has made us too late for several things that could have been had in abundance in March and April. The cotton has been harvested for the most part, and we were not able to carry out the plan of making individual plant selections, and were obliged to content ourselves with seed in bulk. The hard shelled anona at Cahebin has a definite season in April, and no fruits or living seeds were to be had, but an American coffee planter has located here and I left some mailing tubes with him for next year, and with proper reminding in February or March these seeds could probably be had without serious difficulty as the trees are not rare about Cahebin. The tree is quite large and of upright habit, quite different from the other anonas. The leaves are thick, dark green and shining, like those of a magnolia. It is also said to be a free bearer, and the shell is very hard. Another find not properly appreciated before is the green sapote, injerto, or roxtul as the Indians call it. This was described recently by Pittier as *Calocarpum viride* but the generic name is a homonym and I have proposed *Achradelpha* to replace it. This new species is a much finer tree than the true sapote and apparently much better adapted to a cool climate. The foliage is much heavier than that of the sapote and of a deeper green color, in form and general appearance not very unlike that of the loquat. But the trees grow to a large size and are very handsome. They take the place of the sapote altogether at the higher altitudes around Coban, though both trees are found in the Senabu and Cajabin districts. The

failure of the sapote to thrive in Florida need not exclude the green sapote, and a trial planting will be in order. We shall send some seeds by mail and keep others with us. They are like those of the true sapote, but smaller and in some varieties much shorter, for the fruits of the green sapote run through the same series of varietal forms as those of the sapodilla. The quality of the flesh is distinctly superior to that of the true sapote, and much more likely to please the American palate. Anybody who likes papayas or Japanese persimmons might be expected to think favorably of the green sapote, for it comes distinctly into the same class of sweetish smooth-textured pulpy fruits. There is no astringency or unpleasant aftertaste whatever, so that one of the curing difficulties of the persimmon would be encountered. On the outside the fruits are a pleasing yellowish green color, more or less russeted at either end. The flesh inside is yellow, but with a reddish or brownish tinge, not as yellow as some of the Japanese persimmons, nor as dark as others.

"At present we are busy with the pacaya palms which are grown here in great abundance, so that any amount of seed could be obtained. Some of the palms have four, five, or even six pacayas, as the edible male inflorescences are called, so that we did not over-estimate the amount of the fruit that might be produced in a successful planting. I feel confident that the palms would grow very well under hot house conditions such as Goar and Reasoner have, and would suggest that a planting be made on that basis at Miami, with the idea of leaving some of the palms to grow to maturity. They attain a height of 12 to 15 feet but fruit much younger, probably in the third or fourth year.

"I might add that the roxtul or whatever it is to be called should have a chance in California as well as in Florida. Its climatic requirements should be much the same as those of the avocado. It is a much less tropical species than that of the true sapote."

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U. S. DEPARTMENT OF AGRICULTURE, BUREAU OF PLANT INDUSTRY.

WM. A. TAYLOR, CHIEF OF BUREAU.

SERVICE AND REGULATORY ANNOUNCEMENTS.

APRIL, 1914.

JOINT REGULATIONS OF THE SECRETARY OF THE TREASURY AND SECRETARY OF AGRICULTURE UNDER THE SEED IMPORTATION ACT, APPROVED AUGUST 24, 1912.¹

REGULATION 1.—SHORT TITLE OF THE ACT.

The act "To regulate foreign commerce by prohibiting the admission into the United States of certain adulterated grain and seeds unfit for seeding purposes," approved August 24, 1912, shall be known and referred to as "The seed importation act of August 24, 1912."

REGULATION 2.—DEFINITIONS.²

(a) *Clover*.—The term "clover" shall include:

<i>Trifolium hybridum</i>	alsike clover.
<i>Trifolium incarnatum</i>	crimson clover.
<i>Trifolium pratense</i>	red clover.
<i>Trifolium repens</i>	white clover.

(b) *Dodder*.—The term "dodder" shall include all species of *Cuscuta*.

(c) *Millet*.—The term "millet" shall include:

<i>Chaetochloa italica</i> (<i>Setaria italica</i>).....	Hungarian or German millet.
<i>Panicum miliaceum</i>	broom-corn millet.

(d) *Rape*.—The term "rape" shall include the forms of *Brassica napus*, winter rape, commonly grown as forage, but shall not include the forms of *Brassica napus*, summer rape or bird rape, commonly grown for its seed.

(e) *Sorghum*.—The term "sorghum" shall include the saccharine varieties of *Holcus sorghum* (*Sorghum vulgare*).

(f) *Kafir corn*.—The term "Kafir corn" shall include the nonsaccharine, or grain, varieties of *Holcus sorghum* (*Sorghum vulgare*), exclusive of broom corn.

(g) *Weeds*.—The following plants shall be considered weeds:

<i>Abutilon theophrasti</i> (<i>A. avicennae</i>).....	Indian mallow.
<i>Achillea millefolium</i>	yarrow.
<i>Agropyron repens</i>	quack-grass.
<i>Agrostemma githago</i> (<i>Lychnis githago</i>).....	corn cockle.
<i>Allium vineale</i>	garlic, wild onion.
<i>Alsine</i> (<i>Stellaria</i>).....	chickweed.
<i>Amaranthus</i>	amaranth.
<i>Ambrosia</i>	ragweed.

¹ These regulations were promulgated by the United States Treasury Department in the series of Treasury Decisions as No. 34393, April 23, 1914.

² The technical plant names in the lists herein given are those in use by the United States Department of Agriculture. In cases where these names are not those recognized in the Index Kewensis the Kew name follows in parenthesis. The common names are not complete and are given only by way of explanation.

<i>Anagallis arvensis</i>	pimpernel.
<i>Anthemis</i>	Mayweed.
<i>Anthyllis vulneraria</i>	kidney vetch.
<i>Atriplex</i>	saltbush.
<i>Avena fatua</i>	} wild oats.
<i>Avena fatua glabrescens</i> }	
<i>Axyris amaranthoides</i>	_____
<i>Berteroa incana</i> (<i>Alyssum incanum</i>).....	hoary alyssum.
<i>Brassica</i>	mustard.
Except <i>B. napus</i> (winter rape).	
<i>Bromus hordeaceus</i> }	} chess.
<i>Bromus racemosus</i>	
<i>Bromus secalinus</i>	
<i>Bromus tectorum</i>	
<i>Bursa bursa-pastoris</i> (<i>Capsella bursa-pastoris</i>).....	shepherd's-purse.
<i>Camelina</i>	false flax.
<i>Campe</i> (<i>Barbarea</i>).....	winter cress.
<i>Carduus</i> (including <i>Onicus</i>).....	thistle.
<i>Carex</i>	sedge.
<i>Centaurea</i>	star thistle, cornflower.
<i>Cerastium</i>	mouse-ear chickweed.
<i>Chaetochloa glauca</i> (<i>Setaria glauca</i>).....	yellow foxtail, pigeon grass.
<i>Chaetochloa viridis</i> (<i>Setaria viridis</i>).....	green foxtail.
<i>Chenopodium</i>	lamb's-quarters.
<i>Chrysanthemum leucanthemum</i>	oxeye daisy.
<i>Cichorium intybus</i>	chicory.
<i>Conringia orientalis</i>	hare's-ear mustard.
<i>Convolvulus</i>	bindweed.
<i>Cuscuta</i>	dodder.
<i>Datura</i>	Jimson weed.
<i>Daucus carota</i>	wild carrot.
<i>Echinochloa crus-galli</i> (<i>Panicum crus-galli</i>).....	barnyard grass.
<i>Echium vulgare</i>	blueweed.
<i>Eragrostis</i>	stink-grass.
<i>Erodium cicutarium</i>	alfilaria.
<i>Eruca sativa</i>	rocket (roquette).
<i>Erysimum</i>	treacle mustard.
<i>Festuca myuros</i>	rat's-tail fescue.
<i>Galium</i>	bedstraw.
<i>Geranium</i>	crane's-bill.
<i>Grindelia squarrosa</i>	gumweed.
<i>Helianthus</i>	sunflower.
<i>Hibiscus trionum</i>	bladder ketmia.
<i>Hieracium</i>	hawkweed.
<i>Holcus halepensis</i> (<i>Sorghum halepense</i>).....	Johnson grass.
<i>Hypochaeris radicata</i>	cat's-ear.
<i>Ipomoea</i>	morning-glory.
<i>Iva</i>	marsh elder.
<i>Juncus</i>	rush.
<i>Lappula echinata</i> (<i>Echinosperrum lappula</i>).....	stickseed.
<i>Lappula texana</i> (<i>Echinosperrum redowskii</i>).....	stickseed.
<i>Leontodon autumnale</i>	fall dandelion.
<i>Leonurus cardiaca</i>	motherwort.
<i>Lepidium</i>	peppergrass.

<i>Linaria</i>	butter-and-eggs; toadflax.
<i>Lithospermum arvense</i>	corn gromwell.
<i>Lolium temulentum</i>	darnel.
<i>Lotus</i>	bird's-foot trefoil.
<i>Lychnis</i>	campion.
<i>Madia sativa</i>	tarweed.
<i>Matricaria inodora</i>	scentless camomile.
<i>Medicago arabica</i> (<i>M. maculata</i>).....	spotted bur clover.
<i>Medicago hispida denticulata</i> (<i>M. denticulata</i>).....	toothed bur clover.
<i>Medicago lupulina</i>	yellow trefoil.
<i>Melilotus</i>	sweet clover.
<i>Molinia coerulea</i>	—
<i>Nepeta cataria</i>	catnip.
<i>Neslia paniculata</i>	ball mustard.
<i>Notholcus</i> (<i>Holcus</i>).....	velvet grass.
<i>Oenothera biennis</i>	evening primrose.
<i>Picris</i>	ox-tongue.
<i>Plantago</i>	buckhorn; plantain.
<i>Polygonum</i>	knotweed; bindweed; smart-weed; lady's-thumb.
<i>Portulaca oleracea</i>	purslane.
<i>Potentilla</i>	five-finger.
<i>Prunella vulgaris</i>	heal-all.
<i>Ranunculus</i>	buttercup.
<i>Raphanus raphanistrum</i>	wild radish.
<i>Rosa</i>	wild rose.
<i>Rudbeckia hirta</i>	brown-eyed Susan.
<i>Rumex</i>	dock; sorrel.
<i>Salsola</i>	Russian thistle.
<i>Sanguisorba</i>	burnet.
<i>Sherardia arvensis</i>	field madder.
<i>Silene</i>	catchfly.
<i>Sisymbrium</i>	tumbling mustard.
<i>Solanum</i>	nightshade.
<i>Sonchus</i>	sow thistle.
<i>Spergula</i>	spurry.
<i>Syntherisma</i> (<i>Digitaria</i>).....	crab-grass.
<i>Taraxacum</i>	dandelion.
<i>Thlaspi arvense</i>	Frenchweed.
<i>Tragopogon pratensis</i>	goat's-beard.
<i>Trifolium</i>	wild clover.
Except <i>T. hybridum</i> , <i>T. incarnatum</i> , <i>T. pratense</i> , and <i>T. repens</i> .	
<i>Vaccaria pyramidata</i> (<i>Saponaria vaccaria</i>).....	cow cockle.
<i>Valerianella locusta</i> (<i>V. olitoria</i>).....	corn salad.
<i>Verbena</i>	verbena.
<i>Vicia</i>	vetch.

REGULATION 3.—SAMPLING: UPON SPECIFIC REQUEST OF THE SECRETARY OF AGRICULTURE.

The collector of customs shall draw and forward for examination, when so requested by the Secretary of Agriculture or his representative, samples of all seeds enumerated in the act when offered for import into the United States.

REGULATION 4.—SAMPLING: WITHOUT SPECIFIC REQUEST OF THE SECRETARY OF AGRICULTURE.

The collector of customs shall draw and forward for examination, without specific request from the Secretary of Agriculture, samples of all seeds of alfalfa, Canadian bluegrass, Kentucky bluegrass, awnless brome-grass, clover, meadow fescue, millet, orchard grass, rape, redtop, timothy, or mixtures of seeds containing any of such seeds as one of the principal component parts, from noncontiguous territory, entered on pro forma invoices. Similar action should be taken with respect to seeds of the same kinds from contiguous territory whether or not a consular invoice is presented on the entry thereof.

REGULATION 5.—DRAWING SAMPLES.

When a shipment is made up of several lots differing in quality or price, a sample of each lot shall be submitted as though each lot were a separate shipment. The sample of each lot or shipment submitted to the seed laboratories, in accordance with regulation 6, shall be drawn as follows: When a lot consists of five sacks or less, each sack shall be sampled, and when consisting of more than five sacks, every fifth sack, but not less than five sacks, shall be sampled.

REGULATION 6.—SAMPLES, WHERE SENT.

All samples drawn under the act by customs officers shall be forwarded to the respective seed laboratories under which the ports are grouped in the following list of seed-laboratory districts unless otherwise specifically requested by the Secretary of Agriculture or his representative.

1. *Seed Laboratory, United States Department of Agriculture, Washington, D. C.*—All ports in the States of Maine, Vermont, Rhode Island, New York, New Jersey, New Hampshire, Massachusetts, Connecticut, Pennsylvania, Maryland, Delaware, Virginia, Ohio, West Virginia, North Carolina, South Carolina, and Georgia, and Port Huron and Detroit, Mich.

2. *Seed Laboratory, Purdue University, La Fayette, Ind.*—All ports in the States of Indiana, Illinois, Kentucky, Tennessee, Wisconsin, and Minnesota, and all ports in Michigan except Port Huron and Detroit.

3. *Seed Laboratory, Agricultural Experiment Station, Columbia, Mo.*—All ports in the States of Missouri, Iowa, Arkansas, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Colorado.

4. *Seed Laboratory, Agricultural Experiment Station, Baton Rouge, La.*—All ports in the States of Alabama, Mississippi, Florida, Louisiana, Texas, and New Mexico.

5. *Seed Laboratory, Agricultural College, Corvallis, Oreg.*—All ports in the States of Montana, Wyoming, Idaho, Oregon, and Washington.

6. *Seed Laboratory, Agricultural Experiment Station, Berkeley, Cal.*—All ports in the States of California, Nevada, Arizona, and Utah.

REGULATION 7.—NOTICE TO CONSIGNEE.

The collector of customs shall immediately notify the consignee that samples have been drawn and that the remainder of the shipment must be held intact, pending a decision of the Secretary of Agriculture in the matter.

REGULATION 8.—EXAMINATION OF SEEDS—DELIVERY IN BOND.

Seeds offered for importation into the United States from any foreign country, of which samples are taken for examination by the Secretary of Agriculture, shall be admitted only after the samples have been examined and pronounced to be neither adulterated nor unfit for seeding purposes within the meaning of the seed importation act of August 24, 1912: *Provided, however,* That the collector of customs may deliver to

the consignee shipments which have been sampled on the execution of a bond in a penal sum equal to the invoice value of the seeds, together with the duty thereon, if any, conditioned upon the redelivery thereof to the collector when demanded by him for any reason within 30 days from the date of entry. Form Cat. No. 3393 may be slightly modified and used for this bond, and should be drawn to cover also any recleaning that may become necessary.

REGULATION 9.—RELEASE OR RECLEANING OF SHIPMENT.

If the Secretary of Agriculture shall inform the collector that the seeds are not in violation of the said act, the collector shall no longer detain the shipment under that act, but if the seeds are found to be in violation thereof, the collector shall permit the importer to reclean the seeds under bond at the expense of the importer.

REGULATION 10.—SAMPLES OF RECLEANED SEEDS.

The collector of customs shall draw and forward to the Secretary of Agriculture or his representative a sample of the recleaned seeds, together with a sample of the screenings or other refuse removed from the seeds in the course of cleaning, accompanied by a statement of the amount of both the recleaned seeds and of the screenings, and the same procedure shall be followed with respect to such sample of the recleaned seeds as upon the original sample.

REGULATION 11.—EXPORTATION OF SHIPMENT.

If the Secretary of Agriculture shall inform the collector that the sample of the recleaned seeds is not satisfactory, or if the importer shall decline to reclean any shipment of seeds which the Secretary of Agriculture has found to be in violation of the said act, the collector shall refuse delivery of the shipment and require it to be exported under customs supervision.

REGULATION 12.—DISPOSITION OF REFUSE FROM RECLEANING.

The collector of customs shall cause the screenings or other refuse removed from the seeds in the course of recleaning to be exported or ground or otherwise treated so as to render the seeds contained therein incapable of germination before the seed will be released to the owner or consignee.

REGULATION 12½.—DISPOSITION OF DETAINED SHIPMENTS TO BE REPORTED.

The collector of customs shall inform the Secretary of Agriculture of the disposition made of every shipment detained under these regulations.

REGULATION 13.—FAILURE TO EXPORT TO BE REPORTED.

Should the importer fail to export within three months from the date of refusal of delivery any seeds the delivery of which has been refused under these regulations, the collector shall report the facts to the Secretary of the Treasury and to the United States attorney.

REGULATION 14.—WILLFUL VIOLATION TO BE REPORTED.

The collector of customs shall report to the Secretary of the Treasury and to the United States attorney any willful violation of the act which shall come to his knowledge.

REGULATION 15.—APPEAL TO THE SECRETARY OF AGRICULTURE.

All applications for relief from decisions as to the quality of seeds arising under these regulations should be addressed to the Secretary of Agriculture.

REGULATION 16.—FORWARDING OF SAMPLES UNDER TREASURY DECISION 34059 TO BE CONTINUED.

Irrespective of the foregoing regulations, collectors of customs will continue to observe the requirement in Treasury Decision 34059 of January 14, 1914, that two-ounce samples of each lot of all grass, clover, and other forage-plant seeds imported into the United States be forwarded to the Seed Laboratory, United States Department of Agriculture, Washington, D. C.

REGULATION 17.—TAKING EFFECT OF REGULATIONS.

These regulations shall supersede all previous regulations under the seed importation act and shall take effect June 1, 1914.

D. F. HOUSTON,
Secretary of Agriculture.
W. G. McADOO,
Secretary of the Treasury.

Dated April 9, 1914.

THE SEED IMPORTATION ACT.

AN ACT To regulate foreign commerce by prohibiting the admission into the United States of certain adulterated grain and seeds unfit for seeding purposes (37 Stat., 506).

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after six months after the passage of this act the importation into the United States of seeds of alfalfa, barley, Canadian bluegrass, Kentucky bluegrass, awnless brome-grass, buckwheat, clover, field corn, Kafir corn, meadow fescue, flax, millet, oats, orchard grass, rape, redtop, rye, sorghum, timothy, and wheat, or mixtures of seeds containing any of such seeds as one of the principal component parts, which are adulterated or unfit for seeding purposes under the terms of this act is hereby prohibited; and the Secretary of the Treasury and the Secretary of Agriculture shall, jointly or severally, make such rules and regulations as will prevent the importation of such seeds into the United States: *Provided, however,* That such seed may be delivered to the owner or consignee thereof under bond, to be recleaned in accordance with and subject to such regulations as the Secretary of the Treasury may prescribe, and when cleaned to the standard of purity specified in this act for admission into the United States such seed may be released to the owner or consignee thereof after the screenings and other refuse removed from such seed shall have been disposed of in a manner prescribed by the Secretary of Agriculture: *Provided further,* That this act shall not apply to the importation of barley, buckwheat, field corn, Kafir corn, sorghum, flax, oats, rye, or wheat not intended for seeding purposes, when shipped in bond through the United States or imported for the purpose of manufacture, but such shipment shall be subject to provisions of the act of August fifth, nineteen hundred and nine.

SEC. 2. That seed shall be considered adulterated within the meaning of this act—

First. When seed of red clover contains more than three per centum by weight of seed of yellow trefoil, or any other seed of similar appearance to and of lower market value than seed of red clover.

Second. When seed of alfalfa contains more than three per centum by weight of seed of yellow trefoil, burr clover and sweet clover, singly or combined.

Third. When any kind or variety of the seeds, or any mixture described in section one of this act, contains more than five per centum by weight of seed of another kind or variety of lower market value and of similar appearance: *Provided,* That the mixture of the seed of white and alsike clover, red and alsike clover, or alsike clover and timothy, shall not be deemed an adulteration under this section.

SEC. 3. That seed shall be considered unfit for seeding purposes within the meaning of this act—

First. When any kind or variety of clover or alfalfa seed contains more than one seed of dodder to five grams of clover or alfalfa seed, respectively.

Second. When any kind or variety of the seeds or any mixture described in section one of this act contains more than three per centum by weight of seeds of weeds.

SEC. 4. That any person or persons who shall knowingly violate the provisions of this act, shall be deemed guilty of a misdemeanor and shall pay a fine of not exceeding five hundred dollars and not less than two hundred dollars: *Provided,* That any person or persons who shall knowingly sell for seeding purposes seeds or grain which were imported under the provisions of this act for the purpose of manufacture shall be deemed guilty of a violation of this act.

Approved August 24, 1912.

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United States Department of Agriculture,

BUREAU OF PLANT INDUSTRY,

Seed Distribution,

WASHINGTON, D. C.

DISTRIBUTION OF COTTON SEED IN 1914.

This is the twelfth distribution of cotton seed carried on by this office in cooperation with the cotton-breeding investigators of the Bureau of Plant Industry.

During the past 10 years 47 varieties of cotton have been distributed. These have all been bred by the experts of the Bureau of Plant Industry or selected by them because of special local value.

A change has been made in the method of sending out seed of improved varieties of cotton in order to increase the utility of the congressional distribution, in connection with the policy of encouraging the production of cotton on a community basis. The general distribution of a small quantity of seed (1 quart), to enable the farmer to become acquainted with the characters of the variety, is to be followed in the most promising communities by a special distribution of a larger quantity, enough to produce at least one full bale of the new variety and also to furnish a supply of seed for planting the entire crop of the next season.

Only one new variety is being sent out this year. It is now considered more important to establish a few superior varieties in general cultivation than to add to the number of new varieties. Experience with former distributions shows that supplies of pure seed must be maintained by the Department of Agriculture and repeated distributions made until a new variety has become well established.

An introductory statement on "The Improvement of the Cotton Crop by Selection," by Mr. O. F. Cook, who is in charge of the cotton-breeding work of this bureau, explains how the seed may be utilized to the best advantage by the farmer.

R. A. OAKLEY,
Agronomist in Charge.

Approved:

W. A. TAYLOR,
Chief of Bureau.

DECEMBER 24, 1913.

THE IMPROVEMENT OF THE COTTON CROP BY SELECTION.

How can the farmer make the best use of a small stock of seed of a superior selected variety? By understanding and applying the methods by which select seed is produced, so as to keep the selected variety from deterioration. The usual way of treating a small quantity of select seed is not at all calculated to enable the farmer to learn the true value of a new variety or to preserve the purity of an improved stock.

TESTING NOT TO BE COMBINED WITH SELECTION.

A mistake made frequently by farmers, and sometimes by professional breeders, is to attempt to combine testing with breeding. The new variety of cotton is planted by the side of the local variety or a mixed stock in order to test its behavior, and seed is saved from the same planting to increase the stock of the new variety. This plan is open to the serious danger that the seed of the new variety when gathered in the fall will not be pure, but will be contaminated by crossing with the local variety, so that its special value will be lost. The amount of crossing differs with the locality and the season, depending on the abundance of bees or other insects that carry the pollen from one flower to another, but there is usually too much crossing to make it safe to rely on the purity of any stock of seed that has been grown close to another variety of cotton.

ISOLATION OF SEED PLATS.

A farmer who wishes to make a really adequate test of the value of a new variety should plant the seed in a separate plat, removed at least 300 yards from other fields of cotton or separated therefrom by 25 or 30 rows of corn. An isolated planting does not provide, of course, for a close comparison with the local variety, but this can be made in the following year to much better advantage. With the larger stock of seed then available a field planting can be made, as well as test plantings. In the third year there will be enough seed to stock even a large farm with the new variety, if it shows itself superior.

Many farmers are unwilling to give the proper care to a new variety until they have made a preliminary test and convinced themselves that it is really superior. It is for this reason that the plan of sending out a smaller quantity of seed in the general distribution has been adopted. Those who use this small sample of seed for testing purposes and plant it in the same field with another variety or a mixed stock of cotton are advised not to save seed in the fall with any idea that they are keeping a pure stock of the new variety in this way. If the farmer is convinced that the new variety is superior he should get a fresh stock of the seed and plant it in a separate breeding plat, as far away as possible from any other field of cotton.

The distribution of seed of superior varieties of cotton is no longer limited to a single season, as the custom formerly was. Unless improved varieties become established in cultivation in some part of the United States the work of breeding and distribution serves no useful purpose. To increase the number of varieties in a community is not desirable. On the contrary, there would be a distinct advantage if the whole community would grow one variety, if the best variety could be determined. The danger of mixture of varieties by crossing and the mixture of seed at the gin would both be reduced, and the uniformity of the product would enable the community to secure a higher price for its cotton.¹

WHY SELECTION MUST BE CONTINUED.

Unless selection is continued the value of a variety is sure to decline. A well-bred variety is superior to ordinary unselected cotton not only in having better plants but in having the plants more nearly alike. Whether selection has any power to make better plants is a question, but there can be no doubt of the power of selection to keep the plants alike. Even in the best and most carefully selected stocks inferior plants will appear, and if these are allowed to multiply and cross with the others the stock is sure to deteriorate. The pollen from the flowers of inferior plants is carried about by bees and other insects and the seeds developed from such pollen transmit the characters of the inferior parent. Even if they do not come into expression in the first generation they are likely to reappear in the second generation.

To grow cotton from unselected seed involves the same kind of losses as in an orchard planted with unselected seedling apple trees. Less cotton is produced and the quality is also inferior. The higher

¹ Some of the numerous advantages to be gained by a better organization of cotton-growing communities have been described in an article published in the Yearbook of the Department of Agriculture for 1911 under the title "Cotton Improvement on a Community Basis."

the quality of the cotton the more stringent is the requirement of a uniform staple. Unless the fibers have the same length and strength they can not be spun into fine threads or woven into strong fabrics.

PRESERVATION OF VARIETIES BY SELECTION.

The method of selection to be followed in preserving a variety from deterioration is entirely different from that employed in the development of new varieties. The breeder of new varieties seeks for exceptional individuals and prefers those that are unlike any variety previously known. If the selection is being carried on to preserve a variety, the object is not to secure seed from the peculiar plants, but to reject all that deviate from the characters of the variety. The first qualification for such selection is a familiarity with the habits of growth and other characters of the variety, to enable the farmer or breeder to confine his selection to the plants that adhere to the "form" or "type" of the variety and to reject all that vary from the type. Most of the latter would prove to be very inferior and at the same time would increase the diversity of the variety and hasten its degeneration.

IMPROVED METHODS OF FIELD SELECTION.

No matter how good a new variety may be or how carefully it may have been bred and selected, inferior plants are likely to appear, especially when it is grown under new and unaccustomed conditions. A special effort is being made to limit the distribution to seed from uniform fields of cotton, but selection is necessary to keep any variety from deterioration, and it is useless to wait until the deterioration becomes serious before beginning the selection. If proper attention be paid to the roguing out of inferior plants in the first season there may be much less variation in the second, the variety becoming better adjusted to the new conditions.

As uniformity is one of the first essentials of value in a variety, the behavior of a new variety in this respect is one of the first things to be noted. Do not wait till the crop matures, but watch the plants in the early part of the season. Even before the time of flowering it is possible to distinguish "freak" plants by differences in their habits of growth or the characters of their stems and leaves. Whenever such variations can be detected, they should be pulled out at once in order to prevent the crossing of the good plants with inferior pollen. After the bolls begin to reach mature size it is well to go through the plat again and pull out all plants that show by the small size or other peculiarities of the bolls that there has been a variation from the standards of the variety. These preliminary selections

greatly simplify the final selection in the fall, when attention can be limited to the yield and to the characters of the lint and seeds.¹

USE OF PROGENY ROWS IN SELECTION.

Selection can be made still more efficient by the use of progeny rows. The seed of select individual plants is picked separately into paper bags and planted the next season in adjacent rows, in order to test the behavior of the progenies of the different individuals. An inferior progeny can be rejected as a whole and selection limited to the best rows. It often happens that a very good plant produces a comparatively inferior progeny which would not be excluded from the stock unless the progeny-row test were made.

Nevertheless, the use of progeny rows is no substitute for skill and care in making the selection, for if the selected plants are not all of the true type of the variety, admixture by cross-pollination will occur in the progeny rows the same as in a mixed planting. Protection against the danger of crossing between different progenies can be secured by holding over a part of the seed of the select individuals used to plant the progeny rows. The remainder of the seed that produced the best progeny row can be planted in an isolated breeding plat in the year following the progeny test. In this way a special strain is developed from a single superior plant.

METHODS OF TESTING COTTON VARIETIES.

The best way to test the behavior of two varieties of cotton is to plant them in alternate rows so that they can be compared carefully during the growing season and the yield of each row weighed separately at the end of the season. Of course, it is often possible to judge that one variety is superior to another without weighing, but if the results are nearly equal weighing is necessary. Even experienced cotton men are likely to make errors in guessing at the yields of different rows of the field. A variety that "scatters" its lint may appear to be yielding much more than a storm-proof variety with dense, compact lint that can be shown to be much more productive by comparison of actual weights of seed cotton and percentages of lint.²

¹ Methods of selection are treated in greater detail in Circular No. 66 of the Bureau of Plant Industry, U. S. Department of Agriculture, entitled "Cotton Selection on the Farm," which can be obtained without cost upon application to the Secretary of Agriculture. See also Bulletin No. 159 of the Bureau of Plant Industry, U. S. Department of Agriculture, entitled "Local Adjustment of Cotton Varieties."

² See Circular No. 11 of the Bureau of Plant Industry, entitled "Danger in Judging Cotton Varieties by Lint Percentages," which may be had free of cost upon application to the Secretary of Agriculture.

ADMIXTURE OF SEED IN GINS.

One of the most serious difficulties in maintaining the uniformity of a superior variety of cotton is the mixture of seed in gins. A few farmers have their own gins or small hand gins for their seed cotton, and in some localities ginning establishments are beginning to provide small gins that are kept clean for ginning seed cotton. Some farmers take care to avoid the mixture of seed by holding their seed cotton until the end of the season, when the time can be taken to clean out the gin. It is also possible to plant progeny rows or seed plats with unginned seed by wetting the lint before planting.

O. F. COOK,
Bionomist in Charge.

REPORT OF RESULTS OF PLANTING

In order to determine the comparative value of the different varieties of cotton in various cotton-growing regions, a report will be requested in the autumn of 1914, to include the following items:

- (1) Character of the soil.
- (2) Character of the season.
- (3) Whether the seed of the new variety was isolated or planted with a local variety for comparison.
- (4) Name of local variety used for comparison.
- (5) Size and yield of row or plat of the new variety.
- (6) Yield of equal row or plat of the local variety.
- (7) Rating of the new variety for your section—whether excellent, good, fair, or poor.
- (8) A sample of seed cotton representing ten 5-locked bolls, the seed cotton from each boll to be picked carefully and wrapped separately in a small piece of paper.

It is especially requested that growers carefully note the points just enumerated, in order that they may secure the necessary data and be ready to supply accurate information when it is called for next autumn. In this way it is hoped to obtain valuable and reliable information regarding the varieties best adapted to various sections of the cotton belt. Growers receiving this seed who are willing to cooperate with the Department of Agriculture in making the desired test are requested to fill in and return the accompanying franked postal card, which requires no postage.

Growers who wish to share in the special distribution of the following year will be expected to furnish a 10-boll sample of the seed cotton, as mentioned under item 8 of the above list. These samples are to be used for determining the length, quality, and percentage of lint. This information is needed to enable the special distribution of larger quantities of seed (probably half bushels) to be sent to communities that are likely to adopt the new varieties and establish them in regular cultivation.

The samples should be accompanied by the name and address of the grower, as well as the name of the variety grown. It has been necessary to discard many samples because they were not marked and there was no way to identify them.

VARIETIES DISTRIBUTED.

LONE STAR.

The Lone Star variety belongs to the Texas big-boll type and was bred in Texas by Dr. D. A. Saunders, of the Bureau of Plant Industry. It was developed from a single superior plant found in a field of Jackson cotton in the Colorado River bottom near Smithville, Tex., in August, 1905.

In 1908 plats of this selection large enough to give a fair test of yield and lint qualities under field conditions were planted at Waco, Denison, and Cuero, Tex. The yield, percentage, and quality of lint were better than in any other variety with which it was compared, and this superiority has been retained in subsequent seasons.

Following is a technical description of this variety:

Plant of medium height with one to four limbs and many long fruiting branches; main stem very short jointed and less hairy than the majority of big-bolled varieties; the limbs ascending, generally producing fruiting branches at their base; fruiting branches numerous, horizontal or ascending, long, medium short jointed; leaves medium to large, very dark green; petioles very long, somewhat drooping or recurved; bolls very large, round or broadly ovate, an inch and a half to an inch and three-fourths in diameter, an inch and three-fourths to 2 inches in length, with very short, blunt points, 35 to 45 to the pound; involucral bracts very large, closely appressed, coarse veined, deeply cut into long teeth, the longest teeth often meeting over the end of fully developed green bolls; pedicels of medium length, an inch and a half in length below to three-fourths of an inch at the top of the main stem and the extreme ends of the primary and fruiting branches; the bur thick and heavy with very blunt points; lint an inch to an inch and an eighth in length, very strong, and of uniform length of fiber, 38 to 40 per cent.

In this variety the limbs begin to develop fruiting branches 4 to 7 inches from their bases instead of near their extremities. This appears to be an advantage under weevil conditions, as in years of heavy infestation the bulk of the crop must be obtained from the lower third of the plant. In selection considerable stress has been laid upon the short-jointed character of the main stem as essential in developing an early fruiting tendency. The habits of growth are similar to those of the well-known Triumph cotton, and under some conditions the two varieties appear almost indistinguishable; but in other places obvious differences appear, and these are in favor of the

Lone Star. The plants are less inclined to become prostrate, the bolls are larger, and the lint longer and more abundant. Very large yields have been reported—more than two bales per acre on measured areas. Under favorable conditions the fiber attains an inch and an eighth in length. Many bales of this cotton have been sold at a premium. The Lone Star is undoubtedly the best variety now available for general planting in the Texas black-land belt and adjacent regions. The variety is best known in the vicinity of Waco, where it is replacing all other types of short-staple Upland cotton.

The seed for this distribution was grown for the Department of Agriculture near Waco, Tex., by Messrs. John Gorham and D. M. Crenshaw, and at Clarksville, Tex., by Morgan Latimer.

TRICE.

The Trice cotton is an early-maturing short-staple variety developed by Prof. S. M. Bain, of the Tennessee Agricultural Experiment Station, a collaborator of the Bureau of Plant Industry. It is the result of four years' selection from an early variety found on the farm of Mr. Luke Trice, near Henderson, Chester Co., Tenn. The original variety is said to have come from southern Missouri and is known locally in Chester County as "Big-Boll Cluster." In the work of selection particular attention was given to earliness, productiveness, form of stalk, and large bolls, the crops being produced on the farm of Mr. W. N. McFadden, in Fayette County, Tenn. A trial made alongside the original variety in 1908 showed a distinct improvement in all the qualities sought in the selection, as well as greater uniformity.

Though developed with special reference to the light, sandy soils of western Tennessee, the variety has given excellent returns in other districts. The most active demand for the seed has come from northern Mississippi, where the invasion of the boll weevil has led to the planting of earlier varieties; but the variety may also prove valuable in other districts not yet invaded by weevils, for it is distinctly superior to King and other varieties prized for extreme earliness. The behavior of an experimental planting of Trice cotton at Norfolk, Va., in the season of 1912 indicates that the variety may be worthy of distribution across the whole northern rim of the cotton belt.

The Trice cotton is thus described:

Plant rather small, 2 to 5 feet high, of Peterkin type, rarely with distinct basal branches, very prolific; fruiting branches numerous, short jointed; leaves light green, of medium size, hirsute; bolls medium to large, ovate, often angular, 4 to 5 locked; seed large, with dense whitish or brownish tuft; lint fine, seven-eighths to 1 inch long; percentage of lint 28 to 33; season early.

This variety having been developed from a cluster type, this character is liable to reappear. The percentage of reversion apparently is greater under more adverse soil conditions. In maintaining the variety cluster plants should be removed from the field as early as possible.

The seed now distributed was grown in 1913 by Mr. T. C. Long in the vicinity of Jackson, Tenn., and Mr. Frank Lindsey, near Norfolk, Va.

COLUMBIA.

The Columbia cotton is an early long-staple variety well adapted to South Carolina and adjacent States. It was derived from a short-staple variety, the Russell big boll. The first selection was made in 1902 at Columbia, S. C., by Dr. H. J. Webber, formerly in charge of the cotton-breeding work of the Bureau of Plant Industry, and resulted in the finding of a single long-linted plant that gave a superior progeny in 1903. Throughout the process of selection the aim was to select plants having the Russell type of branching and boll, so that the plant of the Columbia is scarcely recognizable as distinct from the Russell variety. The very large boll has also been retained and the variety is in every respect of true Upland type aside from the length of lint and the color of the fuzz.

The Russell variety produces a large seed covered with dark-green fuzz. This character is very undesirable, owing to the discoloration of the lint if ginned while somewhat wet by the pulling off of the green fuzz and also owing to the green color giving undesirable linters. In breeding this variety by selection, therefore, special attention has been given to selecting a white seed. The great majority of the plants of the Columbia variety now produce white seed, but this character has not as yet been entirely fixed and some green seed continues to be produced. There is also a tendency to produce occasional plants with greenish lint. These should be rejected in picking, as the lint is worthless and produces an undesirable discoloration in the bale. The proportion of green seeds is much larger in some seasons than in others, owing to some influence of external conditions not yet understood.

The following is a technical description of this variety:

Plant low, compact, of Russell type, having several long, branching basal limbs, vigorous, prolific; bolls large to very large, ovate, short pointed, opening well, mainly 5 locked; seeds large, fuzzy, white or greenish, 8 to 10 per lock; lint very strong, from $1\frac{1}{4}$ to $1\frac{1}{8}$ inches in length, fine, silky, and very uniform in length; percentage of lint 29 to 33; season early in comparison with the older long-staple varieties.

As a result of continued high prices for long-staple Upland cotton, Columbia cotton is being quite extensively planted in South Carolina

and adjacent States, and especially in the region of Columbia and Hartsville, where supplies of select seed are being maintained by Mr. R. C. Keenan and Dr. D. R. Coker.

The Columbia cotton is increasing rapidly in popularity and in some neighborhoods has become the dominant variety. Growers accessible to long-staple markets usually secure a premium of 5 cents or more above corresponding grades of short-staple cotton. Contrary to the general impression that long-staple varieties are unproductive, the Columbia cotton often outyields short-staple varieties grown under the same conditions. The danger now is that failure to keep the seed pure will result in the production of large quantities of uneven fiber that will injure the reputation of the variety. Hence the importance of continued distribution of a select seed. It is also important that communities undertaking to produce long-staple cotton should provide themselves with facilities for maintaining the uniformity of select varieties.

In order to secure a premium it is necessary to pick the cotton with care, not only to exclude leaves and other "trash," but to avoid immature and weather-stained bolls. It is also necessary that the cotton be dry before ginning, but not "dead" and harsh. The lint should feel "alive." The grower is also to be warned against allowing long and short cotton to be mixed in the same bale. There is no market for mixed bales.

In some localities it is believed that the Columbia cotton suffers more than the other varieties from the rotting of the bolls through attacks of anthracnose or from other causes. These dangers are increased when conditions favor such a luxuriant development of foliage that the bolls are kept moist by heavy shade. The planting of Columbia cotton in Texas is not advised, though excellent results are reported from some localities in the coast belt. The good qualities of the variety are not retained under the more extreme conditions that are often encountered in the drier regions of the Southwest.

The seed for this distribution was grown in 1913 by Messrs. C. H. Carpenter, Easley, S. C., and R. C. Keenan, Columbia, S. C.

FOSTER.

The Foster variety was bred by Dr. D. A. Saunders from a cross between Mebane's Triumph, a Texas big-boll short-staple cotton, and Sunflower, a standard Upland long-staple cotton. The object in making the cross was to obtain a medium long-staple cotton early enough to give profitable yields under boll-weevil conditions, and this purpose has been attained. The variety has been bred and tested under severe weevil conditions, and usually behaves as a very early and prolific variety, even on alluvial soils where other varieties

of long-staple cotton become too luxuriant. Excellent crops of Foster cotton have been raised for several years past, and good reports have been received from numerous localities in Mississippi and Louisiana. The Foster is undoubtedly the best long-staple variety now available as a substitute for the old late-maturing "Peeler" varieties in the region where these were formerly grown. Some of the seed has been sold in Mississippi under the name "Unknown."

Under river-bottom conditions the bolls are large, averaging 50 to the pound, but when grown under the climatic and soil conditions existing in the black-land prairie regions of Texas the bolls are very much smaller. The lint is still somewhat variable, running from $1\frac{1}{8}$ to $1\frac{3}{8}$ inches, depending largely on external conditions. This irregularity in the length of the lint is probably traceable to the hybrid origin of the variety. The short lint is usually found on plants with larger and broader leaves, like the Triumph ancestor. The difference in foliage makes it easy to rogue out the aberrant plants and thus prevent the diversity from increasing. If this precaution be taken, very satisfactory behavior may be expected.

A technical description of the Foster variety follows:

Plant compact, having few erect primary branches and many fruiting branches; fruiting branches long. Leaves short pointed, somewhat drooping, medium sized, thick, dark green. Bolls large, 50 to the pound, ovate, blunt, sharp pointed, largely 5 locked. Lint strong and of fine quality, $1\frac{1}{8}$ to $1\frac{3}{8}$ inches, very abundant, the percentage averaging 34. Seed medium to small, with grayish brown tuft.

The seed for this distribution was grown by Dr. Morgan Latimer, Clarksville, Tex.

DURANGO.

The Durango is a new type of Upland long-staple cotton, introduced and acclimatized by the Department of Agriculture and now distributed for the second time. The original stock of seed came from the Mexican State of Durango, but the variety has been grown and selected for several years in Texas, chiefly at Del Rio and San Antonio. The results of numerous experiments justify the recommendation of the Durango cotton as an early productive variety well suited to cultivation in weevil-infested regions and also in the irrigated districts of the Southwest.

The lint is of excellent quality and attains a length of an inch and a quarter under favorable conditions. The bales of Durango cotton thus far produced have been sold at from 2 to 10 cents a pound above the prevailing market prices of short-staple cotton, premiums of 5 or 6 cents being the rule. The Durango cotton is less injured by drought than other long-staple varieties, though the length or quality of the lint is affected by extreme conditions.

In the Imperial Valley of California this variety has recently attained great popularity, which has resulted in the purchase by the California planters of all the selected stocks of seed available in Texas. This is because the Durango cotton has outyielded the short-staple varieties, as well as producing lint of much higher value.

Following is a short technical description of this variety:

Plant of upright habit, with a strong central stalk and rather stiff, ascending vegetative branches. Fruiting branches of moderate length or rather short, under some conditions becoming semiclusted. Foliage rather deep green, reddening rather early in the season. Leaves of medium size, usually with 5 or 7 rather narrow tapering lobes, leaves with 3 lobes being less frequent than in most other varieties of Upland cotton. Involucral bracts with rather small, triangular cordate bracts, margined with rather short teeth. Calyx lobes rather irregular in length, sometimes very long and slender. Bolls of medium or rather large size; under favorable conditions about 60 to the pound. Shape of bolls, conic oval, with rather smooth surface, the oil glands deeply buried. The proportion of 5-locked bolls varies usually from 40 to 50 per cent. Seeds of medium size, covered with white fuzz and bearing abundant even lint about $1\frac{1}{4}$ inches long under favorable conditions.

More complete accounts of the characters and habits of the Durango cotton in comparison with those of other varieties are to be found in several of the publications of the Department of Agriculture.¹

The seed for this distribution was grown in the vicinity of Victoria, Tex., by J. H. Fleming, and by L. S. Mumford, of Laneville, Ala., Frank Lindsay, of Norfolk, Va., and C. H. Carpenter, of Easley, S. C.

UTOPIA.

The Utopia variety has been bred by Col. William L. Peek, of Conyers, Ga. It is a very productive stock and shows a notable uniformity, both in the characters of the plants in the field and in the lint and seed characters. Though not a late variety, the Utopia is not so early as some others, and this may prove a disadvantage under weevil conditions. A small distribution is being made this season, chiefly confined to the region of northern Georgia, where the variety is known to be well adapted to the local conditions.

The Utopia cotton may be described as follows:

Plants vigorous and upright, with very few vegetative branches; fruiting branches short jointed but not closely clustered; foliage deep green; bolls medium, round, the ripe bolls retaining their upright position, 65 to 75 to the pound; seed medium large, white or gray, the fuzz being rather short and even; lint quite abundant, a fair inch and very uniform in length. The variety may be considered as "storm proof," in that the cotton does not fall out, though the bolls remain in an upright position.

¹ Relation of Drought to Weevil Resistance in Cotton, Bulletin 220, Bureau of Plant Industry, and Cotton Improvement under Weevil Conditions, Farmers' Bulletin 501, U. S. Department of Agriculture.

In a comparative test with 14 other varieties at Conyers, Ga., in the season of 1913, the Utopia ranked among the first in productiveness, 1,200 to 1,250 pounds making a 500-pound bale. The fields where the seed was raised were free from the anthracnose disease.

DIXIE, A WILT-RESISTANT VARIETY.

The Dixie wilt-resistant cotton had its origin in a resistant individual selection made at Troy, Ala., in 1902. The plant was presumably an accidental hybrid between two of the numerous varieties of Upland cotton being grown there on wilt-infected land. This line of work was begun by Mr. W. A. Orton with the object of producing a strain of cotton that could be successfully grown on lands that were infected with the "wilt" or "black-root" disease. From this original selection a uniform strain was developed which proved highly resistant to wilt and which was subsequently named "Dixie." During the succeeding years of its development the variety has been bred by the most careful methods of individual selection and progeny-row tests, always being planted on wilt-infected land so that nonresistant plants would be eliminated as they appeared and only the most resistant retained. As a result the variety has been considerably improved in uniformity, wilt resistance, earliness, size of boll, and length of lint.

Through the planting of the wilt-resistant Dixie cotton, combined with the use of the root-knot rotations outlined below, the wilt or black-root disease is being successfully controlled. The variety has now been grown on a large scale throughout the wilt-infected sections of South Carolina, Georgia, Alabama, and other States for several years and has proved well adapted to use on land where other varieties suffer severe loss from wilt. Crops of a bale or more per acre have been grown in numerous localities on such wilt-infected land. Farmers owning hundreds of acres of land on which wilt reduced the crop 50 to 75 per cent with ordinary varieties have stated that the use of Dixie cotton has saved them from financial ruin.

The following is a technical description of the variety:

Plant vigorous, wilt resistant, of medium height, pyramidal, nearly of the Peterkin type, usually with two or more large basal branches and with long, slender, slightly drooping fruit limbs; leaves of medium size; bolls of medium size, about 75 being required for 1 pound of seed cotton, easy to pick, but very storm proof; seed small, weight of 100 seeds 10 grams, variable in color, but typically covered with greenish brown fuzz; lint about seven-eighths of an inch; percentage of lint to seed 34 to 35.

Root-knot is very generally associated with the wilt disease and is by many farmers confused with it. The two diseases are distinct and require different methods of treatment. Wilt is caused by the

attacks of the fungus *Fusarium vasinfectum*, which penetrates, grows in, and plugs the water-carrying vessels of the plants, thus preventing the rise of water. This disease attacks only cotton and okra. Root-knot is caused by nematodes, or eelworms, microscopic in size, which bore into the roots and cause knots or swellings on them. These nematode-infected areas of the root are thereby weakened and furnish points of entrance for the wilt fungus. Root-knot is known to attack many farm crops besides cotton, notably cowpeas, tomatoes, cucumbers, and cantaloupes. The damage resulting from the two diseases occurring together is much greater than from either alone.

Different methods of treatment are necessary for the control of the troubles. Wilt can be successfully controlled by planting a wilt-resistant variety of cotton in connection with the usual crop rotations practiced by the best farmers. When root-knot occurs on land already infected with the wilt disease no cotton should be planted on it until the diseased field has been rotated one, two, or three years, according to the severity of the disease, with crops immune to the trouble. The best rotations for such root-knot infected land include corn, barley, oats, wheat, rye, Iron or Brabham cowpeas (these are the only commercial varieties known to be resistant to root-knot), velvet beans, peanuts, and beggarweed. The individual farmer can make up from this list of crops the rotations best suited to his locality and system of farming. The object in view is to starve out the nematodes by planting crops on which they can not live. After the root-knot has been thus reduced by rotation, the Dixie wilt-resistant variety of cotton should be planted on land which also has the wilt disease.

The seed for this distribution was grown in 1913 by Mr. J. C. C. Brunson, Florence, S. C., under the supervision of Mr. W. W. Gilbert, who has arranged the distribution of Dixie cotton seed for the season of 1914.



United States Department of Agriculture,

BUREAU OF PLANT INDUSTRY,

Drug and Poisonous Plant Investigations,

WASHINGTON, D. C.

(Preliminary Notice.)

MENZIESIA, A NEW STOCK-POISONING PLANT OF THE NORTHWESTERN STATES.

By C. DWIGHT MARSH, *Physiologist.*

INTRODUCTION.

In the summer of 1912 a rather heavy loss of sheep in the Pend Oreille National Forest, in Idaho, was brought to the attention of the Office of Drug and Poisonous Plant Investigations. This loss was at first supposed to have resulted from poisoning by lupine. A preliminary investigation of the locality and of the facts in connection with the loss resulted in some doubt being thrown upon this theory.

Accordingly, Mr. W. W. Eggleston, botanist in the office mentioned, was asked to make a somewhat careful botanical examination of the region. The results of his investigation confirmed the opinion that lupine was not responsible for the loss and led to the suspicion that *Menziesia* might be the cause of the trouble. Preliminary feeding experiments with this plant show that it is poisonous to sheep, and there seems to be no doubt that the deaths in this case were due to *Menziesia*. Further investigations are necessary in order to clear up the subject of *Menziesia* poisoning, but, inasmuch as the plant is somewhat widely distributed in the northwestern part of the United States, it has seemed desirable to issue a preliminary notice in order to call the attention of stockmen to this subject and to put them on their guard.

DESCRIPTION OF MENZIESIA.

The species of *Menziesia* are straggling, erect, branching shrubs, growing 3 to 7 feet in height. The leaves are deciduous, alternate, entire, thin, glandular hairy, 1 to 2 inches long, and one-half to 1 inch wide. The flowers grow from terminal buds, expanding with the

leaves, are about one-quarter inch broad, globose, bell shaped or cylindrical, and pink to greenish white in color. The pedicels are nodding in flower, but erect in fruit. The calyx is small and flattish, and both the calyx and corolla are four toothed or four lipped. The filaments are eight in number, the style single with the apex four lobed. Both filaments and style are included in the corolla. The capsule is ovoid, oblong, and separated at maturity into four valves. The seeds are narrow and numerous. Plate I shows *Menziesia glabella* in flower and Plate II shows the plant in fruit.

The genus *Menziesia*, containing seven species, is found in North America, Kamchatka, and Japan. One species grows at high altitudes in the southern Allegheny Mountains, while two grow in the western mountains from Wyoming and Oregon north into British Columbia and along the coast from northern California through the Aleutian Islands to Kamchatka. The genus seems to prefer granitic or quartzite soils.

The Rocky Mountain species of *Menziesia glabella*, which is the species found to be poisonous in the Pend Oreille National Forest, grows on moist northern slopes in open woods and about the "balds" at an altitude of from 3,500 to 6,000 feet. It is a local species, occurring abundantly in many places, but one may often travel miles at the right altitude without seeing any specimens. The freshly crushed foliage is sticky and has a strong and disagreeable odor.

SYMPTOMS OF POISONING.

The symptoms exhibited in cases of poisoning by *Menziesia* are much like those seen in poisoning by a number of other plants. Salivation, or frothing at the mouth, is noticeable, and this is followed by weakness, leading to a staggering gait and culminating in a more or less complete paralysis. There is generally pronounced nausea, and sometimes there is difficulty in breathing.

TOXICITY.

Apparently the plant is not extremely toxic, experiments showing that a considerable quantity must be eaten before symptoms of intoxication appear.

PREVENTION OF LOSSES.

From what has been said, it is evident that this is not to be ranked among the extremely dangerous plants. When, however, sheep eat any great quantity of *Menziesia*, losses may occur, and this may prove a serious matter to the individual owner. It is important that herders handling sheep in the mountains of Idaho, Washington, and Oregon become acquainted with the plant and then take precautions to prevent the sheep from eating any large quantity of it.



MENZIESIA GLABELLA IN FLOWER.



MENZIESIA GLABELLA IN FRUIT.

The trouble is most likely to occur either on narrow trails, where the plant grows in abundance, or upon bedding grounds located in neighborhoods in which the plant occurs, particularly if these bedding grounds are used for two or more nights in succession. As has been indicated in a previous publication,¹ grazing animals are not likely to eat any poisonous plant so long as an abundance of other forage is provided. *Menziesia* is no exception to this general rule. It does not seem probable that sheep will take it except when there is a lack of other forage. When trails are bordered by this plant and the sheep are moved along rapidly, many of them will seize upon the *Menziesia* and poisoning may result. When a bedding ground is used repeatedly the sheep will devote themselves at first to the ordinary forage plants, and after that supply is exhausted they will, of course, take what is left. If *Menziesia* is the plant that is left, trouble results. If herders can be brought to recognize the plant and manage their sheep intelligently, it is probable that there will be few losses from this cause.

Approved:

WM. A. TAYLOR,
Chief of Bureau.

MAY 2, 1914.

¹ Marsh, C. Dwight. Stock poisoning due to scarcity of food. Farmers' Bulletin 536, U. S. Department of Agriculture. 1913.

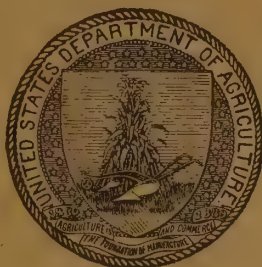
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U. S. DEPARTMENT OF AGRICULTURE.

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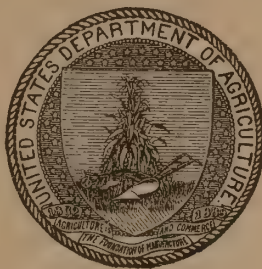
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List of Workers in Subjects Pertaining to Agriculture and Home Economics in the U. S. Department of Agriculture and in the State Agricultural Colleges and Experiment Stations.

UNITED STATES DEPARTMENT OF AGRICULTURE.

(Prepared in the Division of Publications,
JOS. A. ARNOLD, *Chief*.)

OFFICE OF THE SECRETARY.

Secretary of Agriculture, DAVID F. HOUSTON.

The Secretary of Agriculture is charged with the work of promoting agriculture in its broadest sense. He exercises general supervision and control over the affairs of the department and formulates and establishes the general policies to be pursued by its various branches and offices.

Assistant Secretary of Agriculture, BEVERLY T. GALLOWAY.

The Assistant Secretary of Agriculture becomes Acting Secretary in the absence of the Secretary and assists in the general supervision of the work of the department. He is also charged with certain special duties, which include direct supervision of (1) the scientific and technical investigations of the department; (2) miscellaneous clerical and minor changes in the personnel of the department; (3) the publication of results of investigations and experiments; (4) preparation of annual reports and estimates.

Chief Clerk, ROBERT M. REESE.

The Chief Clerk has general supervision of clerks and employees; of the order of business and of the records and correspondence of the Secretary's office; and of expenditures from appropriations for contingent expenses, stationery, etc. He is responsible for the enforcement of the general regulations of the department and is custodian of the buildings.

Office of the Solicitor. FRANCIS G. CAFFEY, *Solicitor*.

The Solicitor is charged by law (act of May 26, 1910) with the direction of the legal work of the department. Accordingly, he acts as legal adviser to the Secretary and the heads of the several branches of the department, conducts its legal work, and represents it in all legal matters. He approves, in advance of issue, all orders and regulations promulgated by the Secretary under statutory authority.

General office administration; preparation of briefs, enforcement of cattle quarantine laws, and plant quarantine act; legal opinions to the Rural Organization Service and Office of Markets; miscellaneous legal matters.

W. P. JONES, *Assistant to the Solicitor, in charge.*

This section attends to legal matters connected with the acts of May 29, 1884, February 2, 1903, and March 3, 1905, relating to the importation, exportation, and interstate transportation of diseased live stock, the plant quarantine act of August 20, 1912, and the Rural Organization Service and Office of Markets. General administration of the office and miscellaneous legal matters are also assigned to this section.

Law work of the Forest Service. R. W. WILLIAMS, *Assistant to the Solicitor, in charge.*

The legal work of the Forest Service falls under four headings, as follows:

Claims: Contests arising out of claims to lands in the national forests under homestead, mineral, and other laws.

Trespasses: Cases arising out of timber, fire, fencing, and other trespasses on the national forests.

Opinions: The furnishing of legal opinions to the Forester and review of opinions written by district law officers to be presented to district foresters.

Miscellaneous: Various legal matters connected with the national forests, such as contracts, forms, etc.; reports to the Secretary on proposed action; correspondence with the Attorney General and the Comptroller of the Treasury; and replies to inquiries addressed to the department.

Enforcement of the food and drugs act. W. C. HENDERSON, *Assistant to the Solicitor, in charge.*

This section prepares cases arising under section 2 of the food and drugs act, June 30, 1906, for submission to the Attorney General; handles seizures under section 10; prepares cases for trial; and prepares notices of judgment for publication under section 4.

Contract work, enforcement of the meat-inspection law and the 28-hour law; patents. C. W. BOYLE, *Assistant to the Solicitor, in charge.*

This section draws agreements and leases; prepares cases arising under the meat-inspection law for submission to the Attorney General, including briefs; and prosecutes applications of employees of the department for patents to be dedicated to the public.

Enforcement of the insecticide act. O. H. GATES, *Assistant to the Solicitor, in charge.*

This section prepares cases arising under section 2 of the insecticide act of April 26, 1910, for submission to the Attorney General; handles seizures under section 10; and prepares notices of judgment for publication under section 4. The compiling and revising of the Laws Applicable to the United States Department of Agriculture is intrusted to this section.

Acquisition of lands under the Weeks forestry law. A. H. McCONVILLE, *Assistant to the Solicitor, in charge.*

In connection with the acquisition of lands under the act of March 1, 1911, this section prepares contracts, supervises the work of record examiners, and handles correspondence with the Attorney General.

Assistants to the Solicitor, stationed in the field.

Branches of the Office of the Solicitor located at Missoula, Mont.; San Francisco, Cal.; and Portland, Oreg., have each two assistants to the Solicitor; the branch offices at Denver, Colo., Albuquerque, N. Mex., and Ogden, Utah, each has one assistant to the Solicitor. These men are legal advisers to the district foresters and handle the legal work of the Forest Service in the field, besides such local legal work of the department as may be assigned by the Solicitor.

Assistants in the field.—G. E. Trowbridge, D. F. McGowan, H. P. Dechant, W. F. Staley, J. F. Lawson, J. O. Seth, Maury Curtis, and E. C. Arnold.

Office of Information. G. W. WHARTON, *Chief.*

The Office of Information is established to secure the widest possible circulation for the discoveries and recommendations of the scientists, specialists, and field workers of the department. It gives out to the public press facts taken from publications, and also from oral statements of specialists. Material so disseminated is set forth in such form as to attract attention and lead to the adoption of the methods recommended. A Weekly News Letter to Crop Correspondents is published, and also each month during the crop season an agricultural forecast outlining the crop prospects.

Office of Markets. CHARLES J. BRAND, *in charge.*

The Office of Markets is making a special study of market conditions, methods of grading, standardizing, packing and shipping, and the nature of the commercial transactions by means of which farm produce gets from the farm to the consumer.

Forest Appeals. THOMAS G. SHEARMAN, *in charge.*

This officer investigates for the Secretary of Agriculture appeals from decisions of the Forest Service, and reports his findings to the Secretary.

Rural Organization Service. T. N. CARVER, *Director.*

The Rural Organization Service is designed to promote business organizations among farmers, not only in the field of marketing, but also in that of finance, insurance, cooperative buying, and cooperative production. As preliminary work a careful study is being made in the field to find out what forms of organization have been tried, under what conditions they have succeeded, and under what they have failed. This information is to be available for the use of farmers who desire to organize themselves into business associations.

The Division of Rural Finance, under Mr. C. W. Thompson, is making a survey of credit facilities and credit needs of farmers in different sections of the country.

The Division of Producers' and Purchasers' Associations, under Mr. L. H. Goddard, is making a similar survey in this field.

Appointment Clerk. R. W. ROBERTS.

The Appointment Clerk prepares all papers connected with appointments, transfers, promotions, reductions, details, furloughs, and removals, and has charge of correspondence with the Civil Service Commission. He is the custodian of oaths of office, personal reports, and efficiency reports. He has the custody and use of the department seal.

Office of Exhibits. F. LAMSON-SCRIBNER, *Special Agent on Exhibits.*

The Office of Exhibits handles the correspondence of the department relative to exhibits at fairs and expositions of various kinds; cooperates with the several branches of the department in preparing exposition material; ships, installs, and cares for such exhibits; and investigates methods of displaying them.

WEATHER BUREAU.

Chief, CHARLES F. MARVIN; *Assistant Chief,* HENRY E. WILLIAMS; *Chief Clerk and Executive Assistant,* C. C. CLARK.

The Weather Bureau has charge of the forecasting of the weather; the issue and display of weather forecasts and storm, cold-wave, frost, and flood warnings; the gauging and reporting of river stages; the maintenance and operation of the United States Weather Bureau telegraph and telephone lines; the collection and transmission of marine intelligence for the benefit of commerce and navigation; the reporting of temperature and rainfall conditions for agricultural interests; and the taking of such meteorological observations as may be necessary to determine and record the climatic conditions of the United States.

Forecast Division. HENRY E. WILLIAMS, *in charge.*

This division receives and charts, twice daily, telegraphic reports of the prevailing weather conditions and issues a statement of impending weather changes in all parts of the country. In the case of severe disturbances warnings are issued to special storm-warning stations along the Lakes and the seacoast.

River and Flood Division. ALFRED J. HENRY, *in charge*.

This division gives information as to stages of water along the navigable rivers and issues flood warnings. It gathers information on the depth of snowfall in the mountains of the West, for a study of the flow of water in the streams supplying irrigation projects, and on the rate of evaporation from ponds and lakes, in the interest of water storage for irrigation, power development, and navigation. It supervises, on the part of the Weather Bureau, the experiment stations maintained jointly by the Weather Bureau and the Forest Service.

Climatological Division. P. C. DAY, *in charge*.

This division has charge of and supervises the work of about 4,200 cooperative stations, 42 special meteorological stations, and about 400 special stations maintained in connection with the corn, wheat, cotton, sugar, rice, tobacco, and fruit industries. From these are collected the records of daily observations of temperature, precipitation, and other meteorological conditions necessary to establish a history of the climate of the various portions of the United States. Data showing the current weather conditions throughout the country are collected and published weekly during the principal crop-growing season and monthly during the remainder of the year; also weekly during the winter months, showing the depth of snow on the ground and the thickness of ice in the rivers and harbors. It has charge of the preparation of the climatological portion of the annual reports of the bureau and supervises the monthly and annual summaries and other publications of the climatological service of the various States, including the weather conditions over the great cereal and cotton growing districts. This division has charge of the barometry of the United States and of the preparation of the normals of pressure, temperature, precipitation, etc. It also collates from reports of marine observers meteorological information pertaining to the oceans, and is charged with the supervision of the radiotelegraph weather service of the Atlantic and Pacific coasts.

Instrument Division. BENJAMIN C. KADEL, *Chief*.

Has supervision of the entire meteorological instrumental equipment of the Weather Bureau; including exposures and installations at stations; the purchase, comparison, and adjustment of all new meteorological instruments and apparatus for stock and issue; construction and repair of instruments and apparatus for station equipments. Purchase, installation, and maintenance of automatic, recording, river gauges, and of the storm-warning towers, flags, and lanterns employed at about 300 display stations on the seacoasts and the Great Lakes; including inspection and personnel thereof.

Telegraph Division. THEODORE T. MOORE, *Chief*.

This division receives and transmits all telegrams, arranges and controls telegraph circuits, maintains and repairs United States Weather Bureau telegraph and telephone lines and submarine cables, and examines all telegraph accounts.

Library. CHARLES F. TALMAN, *in charge*.

The library includes standard works of reference and technical books on meteorology and allied sciences and a complete file of the publications of meteorological and climatological services in all parts of the world. A catalogue is prepared of the meteorological contents of all the principal scientific periodicals of the world, including proceedings and transactions of societies. Translations from foreign languages are made in the library. The librarian has charge of the examinations held throughout the bureau for promotion to the scientific grades.

Office of the Editor. CLEVELAND ABBE, *in charge*.

This office edits and supervises the publication of the Monthly Weather Review; it also has general editorial supervision over scientific and semiscientific papers submitted for publication for the bureau, calling attention to such of these as seem appropriate for the Monthly Weather Review or the Journal of Agricultural Research, the daily press, etc. It prepares such summaries and indexes as may be necessary and notes on the progress of meteorology.

Printing Division. ROBERT SEYBOTH, *Chief*.

This division prints and mails the daily weather map and the various charts and miscellaneous printed matter pertaining to the bureau and has the custody of and distributes station forms.

Division of Supplies. BENJAMIN A. BLUNDON, *Chief*.

This division purchases and issues supplies and is charged with the safe-keeping of all property belonging to the bureau.

Stations and Accounts Division. DELOS T. MARING, *Chief*.

This division audits, adjusts, and prepares for payment all accounts and claims against the bureau; prepares advertisements; issues requests for passenger transportation; prepares the annual estimates of appropriations; transacts all business relating to the financial interests of the bureau; and supervises the construction of Weather Bureau buildings outside of Washington, including repairs thereto.

Mount Weather Meteorological Research Observatory, Mount Weather, Va. WILLIAM R. BLAIR, *in charge*.

The observatory carries on an extensive system of observations and experiments along the line of meteorological research. The work includes the exploration of the atmosphere to altitudes of 3 to 10 miles by means of kites and balloons; research in the allied subjects of solar radiation and atmospheric electricity; and the discussion of meteorological observations from the point of view of their relation to solar physics and weather forecasting. The results of these observations and experiments are described in the Monthly Weather Review.

Weather Bureau stations and work outside of Washington, D. C.

This bureau maintains throughout the United States, in the West Indies, and in Hawaii about 200 meteorological stations employing from 1 to 10 men each.

For forecast purposes the United States is divided into districts comprising: (1) The upper Mississippi Valley and the Northwest, Henry J. Cox, Chicago, Ill., in charge. (2) Louisiana, Texas, Arkansas, and Oklahoma, Isaac M. Cline, New Orleans, La., in charge. (3) Utah, Colorado, New Mexico, and Arizona, Frederick H. Brandenburg, Denver, Colo., in charge. (4) California and Nevada, George H. Willson, San Francisco, Cal., in charge. (5) Washington, Oregon, and Idaho, Edward A. Beals, Portland, Oreg., in charge. (6) The remainder of the United States, forecaster on duty, Washington, D. C., in charge. At the first three of the stations named morning forecasts only are prepared and distributed, at the last three both morning and evening forecasts.

For the collection and distribution of climatological data the United States, including Porto Rico and Hawaii, is divided into 44 local sections, which, with the names of the officials in charge and the section centers, are as follows:

Alabama: Patrick H. Smyth, Montgomery.
 Arizona: Robert R. Briggs, Phoenix.
 Arkansas: Henry F. Alciatore, Little Rock.
 California: George H. Willson, San Francisco.
 Colorado: Frederick H. Brandenburg, Denver.
 Florida: Alexander J. Mitchell, Jacksonville.
 Georgia: Charles F. von Herrmann, Atlanta.
 Hawaii: William B. Stockman, Honolulu.
 Idaho: Edward L. Wells, Boise.
 Illinois: Clarence J. Root, Springfield.
 Indiana: Verne H. Church, Indianapolis.
 Iowa: George M. Chappel, Des Moines.
 Kansas: Thorp B. Jennings, Topeka.
 Kentucky: Ferdinand J. Walz, Louisville.
 Louisiana: Isaac M. Cline, New Orleans.
 Maryland and Delaware: Oliver L. Fassig, Baltimore, Md.
 Michigan: Charles F. Schneider, Grand Rapids.
 Minnesota: Ulysses G. Purssell, Minneapolis.
 Mississippi: William E. Barron, Vicksburg.
 Missouri: George Reeder, Columbia.
 Montana: R. Frank Young, Helena.
 Nebraska: George A. Loveland, Lincoln.

Nevada: Harvey S. Cole, Reno.
 New England: John W. Smith, Boston, Mass.
 New Jersey: G. Harold Noyes, Trenton.
 New Mexico: Charles E. Linney, Santa Fe.
 New York: Wilford M. Wilson, Ithaca.
 North Carolina: Lee A. Denson, Raleigh.
 North Dakota: Orris W. Roberts, Bismarck.
 Ohio: J. Warren Smith, Columbus.
 Oklahoma: J. Pemberton Slaughter, Oklahoma.
 Oregon: Edward A. Beals, Portland.
 Pennsylvania: George S. Bliss, Philadelphia.
 Porto Rico: F. Eugene Hartwell, San Juan.
 South Carolina: Richard H. Sullivan, Columbia.
 South Dakota: Samuel W. Glenn, Huron.
 Tennessee: Roscoe Nunn, Nashville.
 Texas: Bernard Bunnemeyer, Houston.
 Utah: Alfred H. Thiessen, Salt Lake City.
 Virginia: Edward A. Evans, Richmond.
 Washington: George N. Salisbury, Seattle.
 West Virginia: Henry C. Howe, Parkersburg.
 Wisconsin: Henry B. Hersey, Milwaukee.
 Wyoming: Robert Q. Grant, Cheyenne.

BUREAU OF ANIMAL INDUSTRY.

Chief, A. D. MELVIN; Assistant Chief, A. M. FARRINGTON; Chief Clerk, CHARLES C. CARROLL.

The Bureau of Animal Industry has charge of the work of the department relating to the live-stock industry. In general it deals with the investigation, control, and eradication of diseases of animals, the inspection and quarantine of live stock, the inspection of meat and meat-food products, and with animal husbandry and dairying.

Animal Husbandry Division. GEORGE M. ROMMEL, Chief.

This division studies the breeding and feeding of farm animals and poultry, and passes upon the pure breeding of animals imported into the United States for breeding purposes. The division is engaged in work in cooperation with the War Department in encouraging the breeding of horses for military purposes. It studies also the cost of production of poultry and eggs, methods of improving the quality of farm eggs, and market and transportation problems connected with the egg and poultry trade.

Staff.—G. Arthur Bell, senior animal husbandman in horse investigations; Harry M. Lamon, senior animal husbandman in poultry investigations; W. F. Ward, senior animal husbandman in beef cattle investigations; F. R. Marshall, senior animal husbandman in sheep and goat investigations; W. F. Hammond, animal husbandman in charge of Morgan Horse Farm and first horse-breeding district, Middlebury, Vt.; H. H. Reese, animal husbandman in charge of second horse-breeding district, Front Royal, Va.; R. G. Lawton, in charge of third horse-breeding district, Lexington, Ky.; William P. Little, junior animal husbandman in charge of Colorado horse-breeding station, Fort Collins, Colo.; E. L. Shaw, senior animal husbandman in charge of work of this division at the experiment farm, Beltsville, Md.

Biochemie Division. M. DORSET, Chief.

This division prepares tuberculin and mallein for free distribution to health officers for use in official tests; conducts experiments with the object of obtaining vaccines and antitoxins for animal diseases; carries on researches concerning the causes of certain infectious diseases; conducts field demonstrations of methods for controlling hog cholera; takes part in the control of viruses, serums, toxins, and analogous products intended for use in the treatment of domestic animals; carries on experiments with dips and disinfectants; and assists in enforcing the insecticide act of 1910 by examining articles intended for use

in combating insects and fungi which infest domestic animals. In connection with the meat-inspection service, it makes bacteriological and chemical examination of meats and meat-food products and of condiments, etc., used in their preparation.

Scientific staff.—J. A. Emery, assistant chief and member of the Insecticide and Fungicide Board; C. N. McBryde, in charge of bacteriological investigations of meats; R. M. Chapin, in charge of investigations of dips and disinfectants; W. B. Niles, in charge of hog-cholera serum production; U. G. Houck, in charge of cooperative hog-cholera demonstration work; O. B. Hess, in charge of county experiments in eradication of hog cholera; S. E. Bennett, B. W. Murphy, G. S. Weaver, field inspectors in charge of hog-cholera eradication experiments; T. M. Price, in charge of central meat-inspection laboratory; A. H. Roop, C. H. Swanger, W. B. Smith, A. E. Graham, E. A. Boyer, C. N. Marsh, laboratory inspectors in charge of branch meat-inspection laboratories.

Dairy Division. B. H. RAWL, *Chief.*

This division collects and disseminates information concerning dairy farming, the care and improvement of dairy cattle, and the production, care, and distribution of dairy products. It is charged also with the details of administration of the laws concerning the inspection of factories and markets for "renovated" or "process" butter. It carries on research concerning the chemistry and bacteriology of dairy products and in engineering problems that affect various branches of the dairy industry. It also cooperates with State and local institutions in educational work in dairying.

Assistants in charge of sections.—L. A. Rogers, research laboratories; Helmer Rabild, dairy farming investigations; S. C. Thompson, dairy manufacturing investigations; Ernest Kelly, market-milk investigations; J. E. Dorman, western dairy investigations; Robert McAdam, renovated-butter inspection; T. E. Woodward, in charge of the work of the division at the experiment farm, Beltsville, Md.

Field Inspection Division. R. A. RAMSAY, *Chief*; W. P. ELLENBERGER, *Assistant.*

This division, in cooperation with the State authorities, is charged with the work of eradicating scabies in cattle and sheep and the eradication of ticks which infest cattle and transmit disease; also, in cooperation with the Office of Indian Affairs and State authorities, with the eradication of glanders. It has supervision of the interstate transportation of live stock, including inspection, disinfection, certification, etc., also of the details of administering the 28-hour law governing the humane handling of live stock in transit, and the tuberculin testing of cattle and the mallein testing of horses, etc., for interstate movement.

Inspectors in charge of scabies eradication in the field.—H. J. Hammond, Sacramento, Cal.; H. E. Pinkerton, Walla Walla, Wash.; F. E. Murray, Salt Lake City, Utah; Marion Imes, Albuquerque, N. Mex.; W. E. Howe, Denver, Colo.; R. H. Treacy, Bismarck, N. Dak.; James Fleming, Kansas City, Kans.; A. W. Miller, South Omaha, Nebr.

Inspectors in charge of tick eradication in the field.—W. M. MacKellar, San Diego, Cal.; L. J. Allen, Fort Worth, Tex.; F. W. Brewer, Oklahoma, Okla.; A. E. Wight, Little Rock, Ark.; J. A. Kiernan, Birmingham, Ala.; E. M. Nighbert, Atlanta, Ga.; W. K. Lewis, Clemson College, S. C.; T. M. Owen, Norfolk, Va.

Meat Inspection Division. R. P. STEDDOM, *Chief.*

The work of the Meat Inspection Division includes the ante-mortem and post-mortem inspection of cattle, sheep, swine, and goats slaughtered at establishments engaged in interstate or foreign commerce; the supervision of such establishments and of the various processes of preparing, curing, canning, packing, etc., so as to insure sanitary conditions, equipment, and methods; the condemnation and proper disposal of carcasses and products found to be diseased, unwholesome, or otherwise unfit for human food; the marking and certification of meats and products that have been inspected and passed; and the regulation and supervision of the interstate transportation, exportation, and importation of meats and meat food products.

Assistants.—George Dilewig, in charge of western division; A. J. Pistor, in charge of eastern division.

A directory showing the various meat-inspection stations and inspectors in charge may be obtained on application to the bureau.

Pathological Division. JOHN R. MOHLER, *Chief.*

This division conducts scientific investigations of animal diseases; carries on experiments with immunizing agents for the purpose of protecting animals against disease; cooperates with the State agricultural experiment stations with a view to combating diseases peculiar to the localities; determines pathological specimens referred to the division for diagnosis; and prepares and distributes blackleg vaccine.

Scientific staff.—Henry J. Washburn, senior bacteriologist; J. S. Buckley, in charge of field investigations; Adolph Eichhorn, in charge of glanders investigations; B. A. Gallagher, in charge of investigations concerning diseases of poultry and cold-blooded animals; Charles F. Flocken, in charge of cooperative experiments with the Minnesota Experiment Station; Robert J. Formad, assistant in animal pathology; Jacob Traum, assistant in animal bacteriology; John M. Buck, assistant in bacteriology; George M. Potter, in charge of blackleg investigations; H. C. Campbell, in charge of experiments in cooperation with the Pennsylvania Live Stock Sanitary Board; Charles F. Dawson, experiments in cooperation with the Florida State Board of Health; L. Enos Day, in charge of branch pathological laboratory at Chicago, Ill.; George Byron Morse, in charge of branch pathological laboratory at South Omaha, Nebr.

Quarantine Division. RICHARD W. HICKMAN, *Chief.*

The inspection and quarantine of imported animals with a view to excluding contagion, the management of the animal quarantine stations, and the inspection of live stock for export come under this division. The ships carrying exported animals are also inspected, and regulations as to fittings, equipment, ventilation, feed, water, attendants, etc., are enforced. The Quarantine Division administers the sanitary regu-

lations governing the importation of hides, hay, and straw, and directs the tuberculin testing of cattle and the mallein testing of horses for export and import. It also carries on work in cooperation with State and other authorities for the intrastate tuberculin testing of dairy and breeding cattle and the cows supplying milk to cities, with a view to eliminating tuberculosis from such cattle.

Staff.—George W. Pope, assistant chief; B. T. Woodward, in charge of tuberculin testing of dairy cattle.

Zoological Division. B. H. RANSOM, *Chief*.

This division investigates diseases of parasitic origin, collects and describes animal parasites of all kinds, determines such parasites as are sent to the bureau for identification, and keeps a card index of animal parasites and a bibliography of literature relating to them.

Scientific staff.—Albert Hassall, Maurice C. Hall, Howard Crawley, assistant zoologists; W. D. Foster, junior zoologist; Cooper Curtice, assistant in field investigations.

Experiment Station. E. C. SCHROEDER, *Superintendent*; W. E. COTTON, *Assistant*.

The Experiment Station of the bureau is located at Bethesda, Md. It conducts investigations of animal diseases with a view to their control and eradication and their bearing on the public health. A small farm is maintained in such a manner as to provide the other divisions of the bureau with facilities for making observations for which large domestic animals are needed. The work of the station consists of both independent original investigations and investigations in cooperation with and supplemental to those of the other divisions.

Editorial Office. JAMES M. PICKENS, *Editor*.

This office edits manuscripts prepared in the bureau, compiles and prepares information and material for publication and other uses, attends to correspondence relating to the publications and to miscellaneous subjects, makes translations, reads proof, etc.

FOREST SERVICE.

Forester, HENRY S. GRAVES; *Associate Forester*, ALBERT F. POTTER.

The Forest Service administers the national forests, studies forest conditions and methods of forest utilization, investigates the mechanical and physical properties of woods and the processes employed in the manufacture of forest products, and gathers information concerning the needs of the various wood-using industries and the relation of forests to the public welfare generally.

The work of the Forest Service is organized under the Office of the Forester, 5 branches, 7 districts, and 163 national forests.

Office of the Forester.

Office of the Editor. HERBERT A. SMITH, *Editor*; FINDLEY BURNS, *in charge of technical review*; BRISTOW ADAMS, *in charge of information*; DON CARLOS ELLIS, *in charge of educational cooperation*; C. M. BALLARD, *in charge of proofs and forms*.

This office disseminates information concerning forestry through the public press and other channels, and performs the editorial and educational work of the service, including the review and proof reading of publications and forms; cooperation with teachers, officers of public instruction, and others; the preparation, installation, and care of forest exhibits; and the care and use of the lantern-slide collection.

Accounts. M. E. FAGAN, *Chief*; E. A. MELZAR, *Assistant Chief*.

This office is in charge of all fiscal affairs pertaining to the Forest Service—general bookkeeping, controlling accounts, allotments, and liabilities, and all operations of district fiscal agents.

Branch of Operation.

JAMES B. ADAMS, *Assistant Forester in charge*; D. D. BRONSON, *General Inspector*; G. G. ANDERSON, *Administrative Assistant*.

This branch has general supervision of the personnel, quarters, equipment, supplies, and of all permanent improvement work on the national forests.

Geography. C. A. KOLB, *Chief*.

This office collects and preserves maps, compiles general maps and folios for the Forest Atlas, supervises the engraving and printing of maps and diagrams, tabulates forest statistics, collects and records data showing the status of lands within the national forests, and performs photographic work for the service.

Maintenance. GEORGE A. BENTLEY, *Chief*.

The work of this office includes all matters relating to the care of quarters and the purchase and custody of supplies, furniture, instruments, and other equipment in Washington, D. C.

Branch of Lands.

JAMES B. ADAMS, *Assistant Forester in charge*.

This branch has general supervision of all matters relating to the application of the public-land laws to the lands within the national forests, and the uses of national forest lands other than timber sales and grazing.

Land Classification. E. A. SHERMAN, *in charge*; R. V. R. REYNOLDS, *Forest Inspector*.

Examination and classification of lands within the national forests to determine their value for forest purposes.

Settlement.—F. L. HARVEY, in charge. Administration of the Forest Homestead Act of June 11, 1906.

Classification.—H. E. WOOLLEY, in charge. Revision of forest boundaries and general classification of lands within national forests as to their value for forest purposes.

Claims and Occupancy. CHARLES H. SQUIRE, in charge.

The work of this office includes all matters relating to claims on the national forests prior to proceedings before registers and receivers on hearings ordered. The office cooperates with the Office of the Solicitor in procuring necessary evidence to sustain the department's contests; it is also concerned with all questions relating to the occupancy of national forest land for purposes other than timber sales or grazing.

Water Power. O. C. MERRILL, *Chief Engineer*; T. W. NORCROSS, *Assistant Chief Engineer*.

The work of this office includes the handling of all routine connected with the occupancy and use of forest land for hydro-electric power purposes, and of all reports to the Department of the Interior upon rights of way granted by the Secretary of the Interior upon such lands. It also has charge of road-construction work under the provisions of the act of August 10, 1912, appropriating 10 per cent of the annual gross revenue of the national forests for road construction.

Branch of Silviculture.

W. B. GREELEY, *Assistant Forester in charge*; EARLE H. CLAPP and R. Y. STUART, *Forest Inspectors*;
AUSTIN CARY, *Logging Engineer*.

Through the district foresters the Branch of Silviculture has supervision of timber sales, timber and fire trespass, and reforestation on the national forests, and of working plans for their better administration. It conducts forest investigations and cooperates with the States and private owners in fire protection and the practice of forestry.

State Cooperation. J. G. PETERS, *Chief*.

This office, in cooperation with the States, investigates forest conditions and suggests needed legislation and forest policies; prepares digests of State forest laws; cooperates with a number of States, under the Weeks law (act of Mar. 1, 1911), in the protection of the watersheds of navigable streams; directs expenditures for this purpose; and inspects the work done in the field.

Forest Investigations. RAPHAEL ZON, *Chief*; S. T. DANA, *Assistant Chief*.

The Office of Forest Investigations deals mainly with the scientific problems underlying the practical management of national and private forests. It directs the work at the national forest experiment stations and investigates the factors controlling the distribution of forests and forest trees, the relation of forests to stream flow and climate, the conditions under which natural regeneration of cut-over, burned-over, or otherwise denuded areas takes place, and the species and methods adapted to use in artificial reforestation under varying site conditions. It also studies the requirements of important species as to climate, soil, moisture, and light. The office furnishes information to owners regarding the care of their woodlands, gives advice as to the best species to plant, and studies the distinguishing characteristics of native and exotic tree species and their woods. The library of the Forest Service is connected with this office; it contains 12,200 books and pamphlets on forestry and allied subjects and 29,641 photographs of trees and forest conditions.

Branch of Grazing.

ALBERT F. POTTER, *Associate Forester, in charge*; LEON F. KNEIPP, *Assistant Forester*; WILL C. BARNES, *Inspector of Grazing*.

The Branch of Grazing has, through the district foresters, general supervision of the range in the national forests. When the number of stock to be allowed on each national forest has been determined by the Secretary of Agriculture, the Branch of Grazing establishes the year-long grazing fee to be charged for each class of stock and authorizes the grazing of sheep and goats upon those portions of the forests which in the judgment of the Forester may properly be opened to them. It also conducts investigations concerning the best use of the forage resources of the national forests.

Grazing Studies. JAMES T. JARDINE, *Inspector of Grazing, in charge*.

This office deals with investigations aimed to bring about more efficient utilization by permitted live stock of the annual forage crop produced on ranges within national forests. It is also directing the survey and type classification of range lands within national forests by range reconnaissance.

Branch of Products.

W. B. GREELEY, *Assistant Forester, in charge*.

Laboratory. HOWARD F. WEISS, *Director*.

A forest-products laboratory is maintained in cooperation with the University of Wisconsin, at Madison. The laboratory conducts the following classes of experimental investigations in the utilization of forest products: (1) The investigation of problems in experimental research; (2) experimental work in cooperation with commercial operations to verify laboratory experiments on a commercial scale; (3) cooperation with individuals or companies to assist them in applying principles and processes of proved commercial value. The lines of work pursued include wood preservation, wood chemistry, timber tests, technology, and maintenance.

Industrial Investigations. O. T. SWAN, *in charge*.

This office studies the wood-using industries of various States, woods used in manufacture, and methods of disposing of mill waste; collects statistics on the price of lumber at the mill and at the principal distributing markets of the country; and studies specifications and grading rules. The office also secures statistics of importance to the experimental work of the service and studies the movements of lumber to and from the principal markets.

Acquisition of Lands under the Weeks Law.

WM. L. HALL, *Assistant Forester in charge*; K. W. WOODWARD, *in charge of administration of acquired lands*; W. W. ASHE, *in charge of examination of lands*; R. W. DIEFFENBACH, *in charge of survey of lands*.

This office designates the areas where lands are to be purchased, receives proposals, examines lands, conducts tentative negotiations, and prepares recommendations to the Secretary of Agriculture and the National Forest Reservation Commission on lands to be acquired under the act of March 1, 1911, for the protection of the watersheds of navigable streams.

Districts.

District 1.—National forests in northern Idaho, Montana, North Dakota, and the northwest corner of South Dakota; headquarters at Missoula, Mont. F. A. Silcox, district forester; E. W. Kramer, district engineer.

District 2.—National forests in Colorado, Kansas, Nebraska, the greater part of South Dakota, eastern and central Wyoming, Minnesota, and Michigan; headquarters at Denver, Colo. Smith Riley, district forester; E. Leonard Lundgren, district engineer.

District 3.—National forests in most of Arizona and all of New Mexico and Oklahoma; headquarters at Albuquerque, N. Mex. A. C. Ringland, district forester; E. Leonard Lundgren, district engineer.

District 4.—National forests in Utah, northwestern Arizona, most of Nevada, southern Idaho, and western Wyoming; headquarters at Ogden, Utah. E. A. Sherman, district forester; J. P. Martin, district engineer.

District 5.—National forests in California and western Nevada; headquarters at San Francisco, Cal. Coert Du Bois, district forester; F. H. Fowler, district engineer.

District 6.—National forests in Washington, Oregon, northwestern California, and Alaska; headquarters at Portland, Oreg. George H. Cecil, district forester; P. H. Dater, district engineer.

District 7.—National forests in Arkansas and Florida; headquarters at Washington, D. C. H. O. Stabler, acting district forester.

Within each district (except district 7) the Offices of Operation, Silviculture, Grazing, Products, and lands perform duties similar to those performed by the corresponding branches outside the districts. The assistant district foresters in charge of these offices in the several districts are as follows:

Operation.—(1) J. F. Preston; (2) Fred W. Morrell; (3) A. O. Waha; (4) A. C. McCain; (5) Roy Headley; (6) C. H. Flory.

Silviculture.—(1) D. T. Mason; (2) C. M. Granger; (3) J. C. Kircher; (4) Ovid M. Butler; (5) T. D. Woodbury; (6) F. E. Ames and C. S. Judd.

Grazing.—(1) C. H. Adams; (2) J. W. Nelson; (3) John Kerr; (4) Homer E. Fenn; (5) John H. Hatton; (6) T. P. McKenzie.

Products.—(5) C. S. Smith; (6) H. B. Oakleaf.

Lands.—(1) R. H. Rutledge; (2) C. J. Stahl; (3) Frank C. W. Pooler; (4) T. C. Hoyt; (5) L. A. Barrett; (6) C. J. Buck.

BUREAU OF PLANT INDUSTRY.

Physiologist and Pathologist and Chief of Bureau, WILLIAM A. TAYLOR; *Horticulturist and Assistant Chief of Bureau*, LEE CLEVELAND CORBETT; *Chief Clerk*, JAMES E. JONES; *Officer in charge of publications*, J. E. ROCKWELL; *Officer in charge of records*, W. P. COX.

The Bureau of Plant Industry studies plant life in all its relations to agriculture. The scientific work of the bureau is divided into 29 distinct groups, over each of which is placed a scientifically trained officer, who reports directly to the chief and assistant chief of the bureau. The work of the bureau is conducted on the project plan, the investigations under each of the offices being arranged by group projects consisting of closely related lines of work, which group projects are further divided into projects.

Laboratory of Plant Pathology. ERWIN F. SMITH, *Pathologist in charge*.

This is the central working laboratory for all of the pathological investigations conducted by the bureau. Studies of the diseases of a wide variety of crop plants are made in the laboratory and supplemented by field investigations and experimentation.

Scientific staff.—R. E. B. McKenney, pathologist; Florence Hedges, Nellie A. Brown, and Lucia McCulloch, assistant pathologists; Mary K. Bryan and Ella M. Enlows, scientific assistants.

Pathological Collections and Inspection Work. FLORA W. PATTERSON, *Mycologist in charge*.

This office maintains economic collections of pathological and related material; identifies edible and poisonous fungi; studies problems in entomogenous fungi; conducts taxonomic work in cooperation with various offices of the bureau; and makes miscellaneous identifications. In addition to securing new species of pathological fungi and systematically inserting them where they may be readily available for study, card indexes are maintained which refer to descriptions of fungi or relate to mycological or pathological

subjects. According to the regulations of the Federal Horticultural Board, systematic inspections are made of all plants received or distributed by the offices of Foreign Seed and Plant Introduction, Crop Physiology and Breeding Investigations, Gardens and Grounds, and Congressional Seed Distribution, in order to prevent the introduction or dissemination of plant diseases.

Scientific staff.—Vera K. Charles, assistant mycologist; Anna E. Jenkins, scientific assistant.

Fruit-Disease Investigations. MERTON B. WAITE, *Pathologist in charge.*

These studies deal with diseases of fruits and fruit trees and methods of controlling or preventing them. They cover deciduous orchard fruits, citrus fruits, small fruits, and the cultivated nuts. Field demonstrations are an important part of the work.

Scientific staff.—C. L. Shear, Charles Brooks, J. G. Grossenbacher, W. S. Ballard, and J. W. Roberts, pathologists; S. M. McMurran, assistant pathologist; Clara H. Hasse, Durward F. Fisher, Angie M. Beckwith, Lee M. Hutchins, and Raymond B. Wilcox, scientific assistants; J. M. Shull, botanical artist; and Leslie Pierce, assistant in spraying demonstrations and experiments.

Investigations in Forest Pathology. HAVEN METCALF, *Pathologist in charge.*

This office studies various diseases affecting forest trees and timber, as well as ornamental and shade trees. The work is conducted in close cooperation with the Forest Service.

Scientific staff.—George G. Hedgcock, pathologist; E. P. Meinecke, J. Franklin Collins, James R. Weir, William H. Long, Rolla Kent Beattie, and Neil E. Stevens, forest pathologists; Carl P. Hartley, C. J. Humphrey, assistant pathologist; Adeline Ames and Theodore C. Merrill, assistant forest pathologists; Ruby J. Tiller, John S. Boyce, Ruth M. Fleming, and Nicholas R. Hunt, scientific assistants; Caroline Rumbold and Frederick D. Heald, experts.

Cotton and Truck Disease and Sugar-Plant Investigations. W. A. ORTON, *Pathologist in charge.*

These investigations cover diseases of garden vegetables, including field demonstration of methods of control and prevention; diseases of cotton and of cowpeas and other forage crops; the culture and utilization of sugar beets, including diseases, improvement in yield and quality of the crop, extension of sugar-beet culture, and the improvement of methods of growing and handling the crop; and the culture and diseases of sugar cane, sugar maple, sorghum, and other sugar-producing plants.

Scientific staff.—H. A. Edson, F. J. Pritchard, and J. B. Norton, physiologists; C. O. Townsend, I. E. Melhus, W. W. Gilbert, H. W. Wollenweber, and L. L. Harter, pathologists; P. A. Yoder, sugar-cane technologist; C. F. Clark, assistant agronomist; W. B. Clark, assistant chemist; H. B. Shaw, assistant pathologist; Venus W. Pool, Clara O. Jamieson, Ethel C. Field, C. W. Carpenter, M. B. McKay, and Lewis E. Longley, scientific assistants; E. C. Rittue, assistant.

Crop Physiology and Breeding Investigations. WALTER T. SWINGLE, *Physiologist in charge.*

This office investigates the physiology of crop plants with a view to determining the limiting factors which control their successful culture and the breeding and testing of new varieties. Several field stations are maintained. Field investigations are conducted on some of the Indian reservations of the Southwest for testing crop plants which seem likely to be suited for culture by the Indians and by white settlers in adjoining regions. Dates, Smyrna figs, hardy citrus fruits, pistaches, and certain drought-resistant tree crops are being tested.

Scientific staff.—S. C. Mason, arboriculturist; G. P. Rixford, physiologist; Maude Kellerman, botanical assistant; E. M. Savage, assistant plant breeder; Bruce Drummond and E. W. Hudson, assistants.

Soil Bacteriology Investigations. KARL F. KELLERMAN, *Physiologist in charge.*

This work is a study of the relation of bacteria to soil fertility, plant growth, cellulose destruction, and the fixation of nitrogen. Pure cultures of nodule-forming bacteria for leguminous crops are distributed.

Scientific staff.—Ira G. McBeth, physiologist; F. M. Scales, assistant soil mycologist; R. C. Wright, F. L. Goll, and Lewis T. Leonard, scientific assistants.

Acclimatization and Adaptation of Crop Plants; Cotton Breeding. O. F. COOK, *Bionomist in charge.*

These investigations have special reference to the acclimatization in the South and Southwest of Central American varieties of cotton, corn, and other tropical crop plants. The breeding of cottons for the boll-weevil territory is a special feature.

Scientific staff.—G. N. Collins and H. Pittier, botanists; J. H. Kinsler, agriculturist; D. A. Saunders, plant breeder; A. T. Anders, assistant in cotton breeding; P. V. Cardon, assistant agronomist; C. B. Doyle and R. M. Meade, scientific assistants; G. B. Gilbert, J. H. Kempton, C. G. Marshall, Guy S. Meloy, and Walton G. Wells, assistants in crop acclimatization.

Drug-Plant, Poisonous-Plant, Physiological, and Fermentation Investigations. RODNEY H. TRUE and W. W. STOCKBERGER, *Physiologists in charge.*

This branch of the bureau studies the commercial culture of drug-producing crops and tea; stock-poisoning plants and methods of preventing the losses caused by them; and plant physiology and fermentation.

Scientific staff.—A. B. Clawson, Heinrich Hasselbring, W. Van Fleet, C. Dwight Marsh, physiologists; H. H. Bartlett, Otis F. Black, H. H. Bunzel, Frank Rabak, and A. F. Sievers, chemical biologists; S. L. Jodidi, organic chemist; W. W. Eggleston, assistant botanist; Lon A. Hawkins, S. C. Hood, James Thompson, and T. B. Young, scientific assistants; G. Archie Russell, expert.

Grain Standardization. J. W. T. DUVEL, *Technologist in charge.*

These investigations relate to the harvesting of grain and its proper preparation for market; its handling, storing, and grading on the farm, at country elevators, and in the terminal markets; and its handling by transportation companies. The purpose is to fix definite standards for the grading of grain, so as to encourage the use of improved methods of handling. This work is conducted at Washington, D. C., and at branch laboratories located at Baltimore, Md.; Chicago, Ill.; Decatur, Ill.; Fargo, N. Dak.; Kansas City, Mo.; and New Orleans, La.

Scientific staff.—E. G. Boerner, G. H. Baston, H. J. Besley, W. P. Carroll, C. L. Cannon, J. H. Cox, L. M. Jeffers, R. C. Miller, E. L. Morris, Philip Rothrock, C. A. Russell, L. M. Thomas, and F. B. Wise, assistants.

Agricultural Technology, Cotton Standardization, Fiber and Paper Plant Investigations.

N. A. COBB, *Technologist in charge.*

These investigations deal with the improvement of technological methods in crop production; the standardization and grading of cotton, measurement of staple, technological ginning investigations, and testing the waste, tensile strength, and bleaching qualities of the different grades of cotton as standardized by the Government; the testing of plants believed to be suitable for paper manufacture; the investigation of fiber plants likely to prove of value in the United States; and the encouragement of fiber-plant industries.

Scientific staff.—L. H. Dewey, botanist in charge of fiber-plant investigations; W. E. Chambers, technologist; Albert Mann, plant morphologist; D. E. Earle and Fred Taylor, cotton technologists; William S. Dean, William R. Meadows, and George E. Carr, assistants in agricultural technology; Emil G. Arzberger, pathologist; Jason L. Merrill, assistant chemist; Frank C. Miles and Robert L. Nixon, scientific assistants; John F. Barghausen, mechanical assistant.

Biophysical Investigations. LYMAN J. BRIGGS, *Biophysicist in charge.*

This office studies physical problems connected with the work of the Bureau of Plant Industry. Attention is chiefly directed at present to biophysical problems in dry-land agriculture, the water requirements and nutrition of crop plants, the influence of the physical environment on crop growth, and investigations in electroculture.

Scientific staff.—J. O. Belz, assistant; J. W. McLane and Julia R. Pearce, laboratory assistants; A. B. Campbell, mechanical assistant.

Seed-Testing Laboratories. EDGAR BROWN, *Botanist in charge.*

These laboratories examine samples of commercial seeds for the presence of adulteration, and conduct a general propaganda in the interest of pure seed for the farmer. The work is performed both in Washington, D. C., and at cooperative laboratories in the field.

Scientific staff.—F. H. Hillman, assistant botanist; W. L. Goss, George T. Harrington, Emma F. Serrine, Lovina S. Merick, Bertha C. Hite, Anna M. Lute, Norma Waddle, Flora G. Ernst, Helen M. Henry, Cora Jacobs, Etta O. Gilbert, Jessie A. Lee, scientific assistants; Mary L. Stott, Emma S. Doyle, laboratory aids.

Cereal Investigations. MARK ALFRED CARLETON, *Cerealist in charge.*

This work deals with the culture, adaptation, improvement, and uses of cereal crops, the prevention of diseases affecting cereals, and the cultivation and breeding of flax for seed purposes, including a study of flax diseases.

Scientific staff.—Carleton R. Ball, C. E. Chambliss, H. V. Harlan, C. E. Leighty, and C. W. Warburton, agronomists; E. L. Adams, C. H. Clark, F. A. Kiene, jr., assistant agronomists; H. B. Humphrey, pathologist; A. A. Potter, assistant pathologist; John F. Ross and D. E. Stephens, farm superintendents; L. C. Aicher, John H. Parker, J. A. Clark, N. C. Donaldson, J. Michell Jenkins, E. M. Johnston, Jenkin W. Jones, J. D. Morrison, B. E. Rothgeb, T. R. Stanton, Louis Wermelskirchen, and F. R. Babcock, scientific assistants; G. A. McMurdo, assistant; L. R. Breithaupt, L. C. Burnett, W. T. Craig, and A. D. Ellison, agents.

Corn Investigations. C. P. HARTLEY, *Physiologist in charge.*

These investigations cover the principal factors that influence the quantity, quality, and profitableness of acre production of corn. They are conducted throughout the United States on farms of members of corn-improvement clubs and other interested farmers.

Scientific staff.—Ernest B. Brown, Curtis H. Kyle, and L. L. Zook, physiologists; J. G. Willier and Fred D. Richey, scientific assistants.

Tobacco and Plant Nutrition Investigations. W. W. GARNER, *Physiologist in charge.*

The tobacco work has to do with the improvement of tobacco by hybridization and selection, the improvement of methods of growing and handling the crop, the combating of diseases, and the general study of the tobacco-growing industry. Experiments and demonstrations in the growing of tobacco in rotation with farm crops are features of the work.

The plant-nutrition studies relate to some of the broad problems concerned in the growth and development of crop plants as affected by nutrition.

Scientific staff.—E. H. Mathewson and G. W. Harris, crop technologists; Otto Olson, E. G. Beinhart, D. E. Brown, W. M. Lunn, E. G. Moss, R. H. Milton, and James P. Young, assistants in tobacco investigations; J. E. Blohm, special agent; J. S. Cunningham, expert; Charles W. Bacon and H. A. Allard, assistant physiologists; Charles L. Foubert, scientific assistant; Charles S. Ridgway, assistant in botanical laboratory work.

Forage Crop Investigations. CHARLES V. PIPER, *Agrostologist in charge.*

This forage crop investigations include methods of production; development and dissemination of new valuable varieties; extension of forage crops into sections where they are adapted but are grown only to a limited extent; and cooperation in the introduction and extension of new crops.

Scientific staff.—J. M. Westgate and H. N. Vinnall, agronomists; Roland McKee, assistant agrostologist; M. W. Evans, W. J. Morse, A. B. Cron, Samuel Garver, R. W. Edwards, Robert E. Getty, and Harvey L. Westover, scientific assistants.

Alkali and Drought Resistant Plant Breeding Investigations. T. H. KEARNEY, *Physiologist in charge.*

This office investigates the alkali resistance of crop plants; develops, by breeding and selection, strains of field crops which will be more resistant to drought than the varieties now obtainable; and studies the physiology of drought resistance. The work is conducted in close cooperation with other branches of the bureau concerned with the upbuilding of agriculture in the West and Southwest.

Scientific staff.—H. L. Shantz and A. C. Dillman, physiologists; R. L. Piemeisel, scientific assistant.

Economic and Systematic Botany. FREDERICK V. COVILLE, *Botanist in charge.*

This office maintains economic collections of cultivated plants and makes systematic studies of grasses and other economic plants, compiles information on native plants for publication, tests wild and little-known plants, and experiments with a view to the improvement of the grazing areas on the national forests.

Scientific staff.—A. S. Hitchcock, systematic agrostologist; W. E. Safford, economic botanist; P. L. Ricker and A. H. Moore, assistant botanists; Agnes Chase and Ivar Tidestrom, scientific assistants; Alice Henkel, assistant.

Farm Management Investigations. W. J. SPILLMAN, *Agriculturist in charge.*

This office studies the details of farm practice. Its main object is to improve farm practice by introducing better business methods and by applying the principles of science wherever they are known. The types of farming prevailing in the various sections of the country are being studied in a number of localities, and a detailed study of farm economics and business principles is being made. Studies of range management and of the use of the cactus as a forage plant are also a part of the work.

Scientific staff.—J. H. Arnold, O. H. Benson, G. A. Billings, D. A. Brodie, Levi Chubbuck, L. A. Clinton, R. W. Clothier, J. S. Cotton, H. R. Cox, M. A. Crosby, L. G. Dodge, J. A. Drake, D. W. Fear, C. L. Goodrich, David Griffiths, Byron Hunter, J. M. Johnson, W. A. Lloyd, J. C. McDowell, A. D. McNair, H. A. Miller, A. G. Smith, C. B. Smith, Harry Thompson, E. H. Thomson, E. O. Wooton, and D. W. Working, agriculturists; O. E. Baker, C. M. Bennett, Maurice C. Burritt, G. W. Bush, L. G. Connor, D. H. Doane, L. W. Fluharty, H. W. Gilbertson, C. M. Hennis, C. E. Hoke, R. C. Hoopingarner, H. B. McClure, H. H. Mowry, C. P. Reed, A. B. Ross, F. D. Stevens, S. M. Tracy, R. E. Willard, assistant agriculturists; E. A. Boeger, H. R. Cates, Jay Coryell, H. M. Dixon, W. C. Funk, Earl S. Haskell, H. N. Humphrey, Oscar Juve, M. B. Oates, F. E. Robertson, A. K. Rothenberger, L. W. Kephart, J. L. Sherman, E. A. Stanford, Earl D. Strait, H. A. Turner, H. F. Williams, A. P. Yerkes, and J. F. Zimmer, scientific assistants; J. S. Ball, Lillian Church, M. O. Cooper, M. R. Cooper, W. R. Humphries, G. H. Miller, H. B. Munger, O. S. Rayner, H. G. Strait, and Raymond S. Washburn, assistants in farm cost accounting; W. A. Etherton, farm architect; Ilena M. Bailey, expert; G. I. Christie, R. J. Evans, K. L. Hatch, E. K. Hibshman, A. N. Hume, Wm. D. Hurd, C. D. Jarvis, E. C. Johnson, Eben Mumford, C. W. Pugsley, A. D. Wilson, Hiram T. French, Thos. P. Cooper, R. B. Coglon, C. F. Curtiss, and B. H. Crocheron, State leaders.

Farmers' Cooperative Demonstration Work. BRADFORD KNAPP, *Special Agent in charge.*

This work is a system of practical instruction for farmers on their own farms by which better farm practices along all lines are illustrated through demonstrations, carried out under the instruction of a corps of State, district, and county agents. The work is mainly in cooperation with States, colleges of agriculture, county organizations, and others. In cotton territory this work specially shows farmers how to raise cotton under boll-weevil conditions, to diversify, etc. Boys' and girls' demonstration work is also conducted on farms.

States.—Texas, Oklahoma, Louisiana, Arkansas, Tennessee, Mississippi, Alabama, Georgia, Florida, South Carolina, North Carolina, Virginia, Maryland, West Virginia, and Kentucky.

Scientific staff.—J. A. Evans, O. B. Martin, agriculturists and general assistants; W. B. Mercier, H. E. Savely, E. Gentry, I. W. Hill, agriculturists and general field agents; Jesse M. Jones, assistant. W. F. Proctor, W. D. Bentley, C. W. Watson, Mason Snowden, R. S. Wilson, J. Phil Campbell, W. W. Long, C. R. Hudson, T. O. Sandy, H. D. Tate, August Stabler, Dr. Fred Mutchler, C. K. McQuarrie, and N. T. Frame, State agents.

Dry-Land Agriculture Investigations. E. C. CHILCOTT, *Agriculturist in charge.*

This office studies proper cultural methods for the growing of crops in the semiarid regions of the West, especially in that portion known as the Great Plains area. The objects are to determine the best methods of soil preparation and crop rotation for the conservation of moisture and the maintenance of humus in the soil.

Scientific staff.—J. S. Cole, W. W. Burr, traveling field assistants; W. A. Peterson, J. M. Stephens, O. J. Grace, W. D. Griggs, F. L. Kelso, and J. E. Mundell, farm superintendents; C. B. Brown, C. A. Burmeister, E. F. Chilcott, A. L. Hallett, J. H. Jacobson, L. N. Jensen, J. G. Lill, O. R. Mathews, H. C. McKinstry, G. W. Morgan, A. J. Ogaard, W. M. Osborn, M. Pfaender, J. T. Sarvis, H. G. Smith, R. S. Towle, J. C. Thysell, Leroy D. Willey, Joseph B. Kuska, and Arthur E. Seamans, assistants.

Western Irrigation Agriculture. C. S. SCOFIELD, *Agriculturist in charge.*

This work is concerned with the development of profitable agriculture on the lands to be placed under irrigation in the western United States, and also with the testing of various crops suited for growth under irrigation. The work is conducted in cooperation with a number of the investigational offices of the bureau.

Scientific staff.—F. D. Farrell, agronomist; F. B. Headley, assistant agriculturist; Beyer Aune, R. E. Blair, Dan Hansen, S. H. Hastings, and Fritz Knorr, farm superintendents; Argyle McLachlan, W. E. Townsend, J. A. Holden, C. R. Letteer, C. E. Peterson, Ernest W. Curtis, assistants.

Horticultural and Pomological Investigations. A. V. STUBENRAUCH, *Pomologist and Horticulturist in charge.*

These investigations are concerned with the improvement of methods of growing, handling, shipping, sorting, and marketing perishable fruits and truck and related crops; landscape and vegetable gardening; floriculture; and related subjects. The work is subdivided into fruit-marketing investigations; fruit-transportation and storage investigations; fruit-district investigations; viticultural investigations; nut-culture investigations; pomological breeding investigations, including the improvement of fruits by bud selection; miscellaneous investigations bearing on the development of the fruit industry; truck-crop investigations; landscape-gardening, floriculture, and miscellaneous horticultural investigations; potato investigations; fruit-history investigations; fruit-nomenclature investigations; and fruit-identification investigations.

Scientific staff.—G. B. Brackett, H. P. Gould, George C. Husmann, A. W. McKay, H. J. Ramsey, C. P. Close, and E. R. Lake, pomologists; A. D. Shamel, physiologist; S. J. Dennis, refrigeration technologist; William Stuart, and D. N. Shoemaker, horticulturists; W. F. Wight, botanist; W. W. Tracy, sr., superintendent of testing gardens; F. L. Mulford, landscape gardener; H. C. Thompson, W. V. Shear, and H. M. Conolly, assistant horticulturists; C. W. Mann, C. A. Reed, and C. S. Pomeroy, assistant pomologists; C. G. Patten, expert; Richard Schmidt, assistant in viticultural investigations; William E. Mosher, assistant in refrigeration; George M. Darrow, Charles T. Dearing, George W. Dewey, W. F. Fletcher, K. B. Lewis, Leo B. Scott, D. D. Ward, Margaret Connor, P. M. Lombard, Herbert C. Gore, Edward L. Markell, scientific assistants; F. L. Husmann, viticultural superintendent.

Experimental Gardens and Grounds. E. M. BYRNES, *Assistant in charge.*

This office is charged with the care and ornamentation of the department grounds, the maintenance of greenhouses and plant collections, and the propagation of plants for experimental and other purposes. Experimental work with florists' crops is also being conducted in the greenhouses.

Congressional Seed Distribution.

This work consists of the securing, packeting, and mailing of the quantities of vegetable, flower, and other seeds and plants necessary for congressional distribution, as well as the testing, propagation, and distribution of improved seeds of various crops.

Staff.—R. A. Oakley, agronomist in immediate charge; Oliver F. Jones, executive clerk; J. E. W. Tracy, assistant superintendent of testing gardens.

Foreign Seed and Plant Introduction. DAVID FAIRCHILD, *Agricultural Explorer in charge.*

This office secures promising new seeds and plants, both by agricultural exploration and by correspondence, and these are tested at the plant-introduction gardens or through cooperation with other offices, experiment stations, experimenters, and private individuals. Investigations in plant propagation and in the development of certain plant industries are features of the work.

Scientific staff.—P. H. Dorsett, plant introducer, in charge of plant-introduction field stations; Peter Bisset, plant introducer, in charge of foreign plant distribution; Frank N. Meyer and F. Wilson Popenoe, agricultural explorers; George W. Oliver, plant breeder and propagator; H. C. Skeels and R. A. Young, scientific assistants; Stephen C. Stuntz, botanical assistant; Robert L. Beagles, assistant farm superintendent, in charge of plant-introduction field station, Chico, Cal.; Edward Simmonds, garden and field station superintendent, in charge of subtropical plant introduction field station, Miami, Fla.; H. E. Juene-mann, in charge of bulb-testing garden, Bellingham, Wash.; John M. Rankin, assistant farm superintendent, in charge of Yarrow plant-introduction field station, Rockville, Md.; W. H. F. Gomme, assistant farm superintendent, in charge of plant-introduction field station, Brooksville, Fla.; J. H. Allison, expert.

Arlington Experimental Farm. Directed by Assistant Chief of Bureau.

The Arlington farm is the field laboratory at Washington for the Bureau of Plant Industry, as well as for other bureaus of the department. Widely varying field tests are conducted on the farm.

Staff.—E. C. Butterfield, assistant horticulturist in general charge; J. C. Criswell, assistant superintendent.

BUREAU OF CHEMISTRY.

Chief, CARL L. ALSBERG; *Assistant Chief,* R. L. EMERSON.

The Bureau of Chemistry is concerned primarily with questions of agricultural chemistry of public interest; analytical work and investigations under the food and drugs act, and other chemical investigations referred to it by other branches of the Government service.

Office of General Administration. R. L. EMERSON, *Assistant Chief in charge.*

A. S. Mitchell, administrative assistant; S. H. Ross, administrative assistant; F. B. Linton, supervising clerk; H. F. Fitts, chief clerk; A. E. Draper, librarian; G. O. Savage, editor; J. G. Coleman, H. J. Demaree, and H. Perrone, executive clerks.

State Cooperative Food and Drug Control. J. S. ABBOTT, *Chemist in charge.*

This office endeavors to promote close and cordial cooperation between State and Federal officials charged with the enforcement of all food and drug laws, works out policies for such cooperation, and seeks to unify and harmonize the work and policies of such officials.

Animal Physiological Chemical Laboratory. F. C. WEBER, *Chemist in charge.*

The work in this laboratory includes metabolism and feeding experiments with foods, organic and inorganic compounds, and various carbohydrates; a complete study of infant foods and of the application of chemical methods to the determination of deterioration of animal foods; collaborative work on the production and composition of gelatin and glue; and experimental work to improve the methods of analysis ordinarily employed in physiological chemistry.

Scientific staff.—F. C. Cook, H. W. Houghton, and J. B. Willson, assistants.

Bacteriological Laboratory. —, *in charge.*

This laboratory makes bacteriological examinations of food materials, both fresh and cold stored, and inspects methods of handling and preparation. The germicidal, antiseptic, and preservative value of certain drugs, chemicals, and fruit juices is tested; bacteria, yeasts, and molds are identified and classified; and surgical dressings, gauzes, ligatures, etc., are examined to determine their sterility.

Scientific staff.—C. Bates, R. C. Greathouse, E. Le Fevre, and M. L. Mason, assistants.

Beverage Laboratory. J. G. RILEY, *Chemist in charge.*

This laboratory conducts field investigations on all potable beverages, including temperance beverages, fermented beverages, and distilled spirits, to obtain proper data for the enforcement of the Food and Drugs Act. Collaborative work for the purpose of improving the methods of analysis of these various products is also an important phase of the work. Check analytical work is also done on interstate and import samples sent in by the branch laboratories.

Scientific staff.—S. Coopersmith, M. J. Ingle, and J. I. Palmore.

Carbohydrate Laboratory. C. S. HUDSON, *Chemist in charge.*

The sugar-inspection laboratory analyzes sugars, sirups, molasses, honeys, jellies, jams, preserves, infant foods, confectionery, and similar substances in connection with the enforcement of the food and drugs act. In cooperation with the contracts laboratory, examinations are made of dextrans, glucose, starches, and other carbohydrate materials used by the Bureau of Engraving and Printing, as well as of all samples of sugars, starches, sirups, and molasses bought by the General Supply Committee. The laboratory investigates the manufacturing processes used in the production of raw and refined sugar and molasses, maple sugar, sirups from cane, maple, and sorghum, and confectionery and jellies. Improved methods of chemical analysis are studied, and also, in collaboration with the International Commission for Uniform Methods of Sugar Analysis, the characteristic constants by which pure carbohydrates are distinguished.

Scientific staff.—C. G. Church, J. K. Dale, T. S. Harding, J. M. Johnson, S. F. Sherwood, M. N. Straughn, and E. Yanovsky, assistants.

Citrus By-Products Laboratory. E. M. CHACE, *Chemist in charge.*

This laboratory directs its attention to devising methods for the utilization of cull oranges and lemons. With this in view, methods are being studied for the manufacture of citric acid, oils of lemon and of orange, concentrated orange juice, and orange vinegar.

Scientific staff.—A. R. Albright, C. P. Wilson, assistants.

Contracts Laboratory. P. H. WALKER, *Chemist in charge.*

The contracts laboratory examines materials which are used by the Department of Agriculture, to determine their purity and compliance with specifications, and does similar work for the other executive departments of the Government. Specifications for supplies are prepared and criticized. Paints and paint materials are studied in cooperation with the Bureau of Standards and the American Society for Testing Materials. Other special investigations deal with enamel-ware cooking utensils, rubber goods, postmark canceling inks, writing inks, typewriter ribbons, glue, soap, lubricating oils, and other supplies used by the Government.

Scientific staff.—C. B. Bacon, E. W. Boughton, J. H. Bower, E. F. Deysher, G. J. Hough, H. C. McNeil, G. C. Schmidt, and F. W. Smither, assistants.

Dairy Laboratory. G. E. PATRICK, *Chemist in charge.*

The dairy laboratory examines dairy products of every description and studies methods for making such examinations. A large part of the work at present is the examination of interstate samples of milk, butter, cheese, condensed milks, dried milks, malted milks, lactated foods, ice cream, and other dairy products to determine questions as to their adulteration and misbranding under the food and drugs act. Samples of imported dairy products are examined, and also samples of dairy products submitted by the General Supply Committee of the Government. Samples from other sources are analyzed when such work promises to be of public benefit.

Scientific staff.—C. H. Biesterfeld, L. W. Ferris, J. T. Keister, and C. C. Scheffler, assistants.

Drug Laboratory. L. F. KEBLER, *Chief.*

This laboratory studies the properties, composition, and quality of drugs and medicinal preparations, and analyzes samples of such products taken in the enforcement of the food and drugs act. It also studies methods which may lead to more satisfactory analytical processes, especially for testing potent plant drugs and products derived from them.

Scientific staff.—V. K. Chesnut, T. C. Merrill, F. P. Morgan, C. E. Parker, H. M. Rhea, B. H. St. John. Drug inspection laboratory: ———, chief; H. E. Buchbinder, C. O. Ewing, E. C. Merrill, A. G. Murray, S. Palkin, assistants. Synthetic products laboratory: W. O. Emery, chief; G. C. Spencer, C. D. Wright, assistants. Essential oils laboratory: E. K. Nelson, chief.

Food Control Laboratory. H. M. LOOMIS, *Chemist in charge.*

The food control laboratory supervises the inspection of food products (not including cattle feeds or dairy products) under the food and drugs act. This work includes the examination of analytical reports on official food samples, the consideration of cases prepared for citation or prosecution, handling of correspondence relating to cases, and to general questions arising under the food and drugs act as they relate to these products. Special studies are also made of the manufacture and production of food products, including work on analytical methods for the examination of these products, particularly in collaboration with the Association of Official Agricultural Chemists.

Scientific staff.—A. W. Broomell, C. O. Dodge, A. M. Doyle, P. B. Dunbar, H. A. Lepper, H. S. Paine, and E. L. P. Treuthardt, assistants.

Food Investigation Laboratory. A. L. WINTON, *Chemist in charge.*

This laboratory conducts investigations that are necessary as a basis for the regulatory work in the food control. At the present moment the following problems are under investigation:

The composition of American oils and fats; the deterioration of corn meal in storage; the composition of commercial generator vinegar and the changes taking place in the conversion of cider into vinegar; the exact determination of the heavy metals in foods; the use of charlock as an adulterant.

Scientific staff.—H. S. Bailey, R. W. Balcom, M. Boyle, L. B. Burnett, W. D. Collins, R. S. Hollingshead, H. E. Patten, and L. A. Wolfe, assistants.

Fruit and Vegetable Utilization Laboratory. H. C. GORE, *Chemist in charge.*

This laboratory is investigating the utilization of culls and surplus fruits and vegetables. At present apples and potatoes are receiving the most attention. Much of this work is in cooperation with the Bureau of Plant Industry. E. G. Grab, assistant.

Leather and Paper Laboratory. F. P. VEITCH, *Chemist in charge.*

This laboratory conducts investigations of tannins and tanning materials, their effects upon the strength and properties of leather, and processes involved in their production; problems relating to the production of leather; the qualities of papers and their fitness for use in the Department of Agriculture and other departments of the Government which may request such investigations; the production of paper; the nature and uses of turpentine and resins, together with improved processes of production; the destructive distillation of wood and methods of improving the quality and quantity of the products. Turpentine and rosin are examined under the food and drugs act. Papers, leathers, turpentine, resins, and textiles are examined for the departments of the Government requesting such work, and specifications are prepared for the purchase of these articles.

Scientific staff.—M. G. Donk, R. W. Frey, H. P. Holman, E. O. Reed, J. S. Rogers, C. F. Sammet, and C. F. Speh, assistants.

Microchemical Laboratory. B. J. HOWARD, *Microscopist in charge.*

This laboratory makes microscopical and microchemical studies of foods, drugs, cattle feed, paper and textile materials, miscellaneous agricultural products, etc. It also makes microscopical examinations of insecticides, and studies methods for their microscopical identification and estimation. Special attention is given to the histological study of fruits, spices, cereals, starches, and other agricultural products for the purpose of perfecting methods for detecting the adulteration of these products.

Scientific staff.—G. L. Keenan, E. A. Read, H. Sherman, B. H. Silberberg, and C. H. Stephenson, assistants.

Miscellaneous Laboratory. J. K. HAYWOOD, *Chief.*

This laboratory studies waters, cattle foods, forage crops, grains, insecticides and fungicides, trade wastes, and certain hygienic problems, makes analyses under the food and drugs act and the insecticide act, and performs such miscellaneous chemical work as may be referred to it. In collaboration with the Bureau of Plant Industry, studies are being made of the changes in composition of grains due to storage and shipping, the composition of range forage plants of the West, and the efficiency of certain insecticides and their effect upon foliage. In collaboration with several experiment stations, studies of more complete methods of analysis of insecticides are being made.

Scientific staff.—Water laboratory: W. W. Skinner, chief; W. F. Baughman, F. B. Furber, C. Huckle, and J. W. Sale, assistants. Cattle-food and grain laboratory: G. L. Bidwell, chief; C. E. Goodrich, J. B. Reed, P. H. Waldruff, and G. P. Walton, assistants. Insecticide and fungicide laboratory: C. C. McDonnell, chief; A. K. Balls, F. L. Elliott, J. T. Graham, E. L. Griffin, O. D. Knight, W. J. Morgan, E. J. Nealon, W. B. O'Brien, W. B. Pope, R. C. Roark, C. M. Smith, C. H. Walker, and H. A. Whitman, assistants. Trade-wastes laboratory: Under chief; W. D. Lynch, assistant.

Nitrogen Laboratory. T. C. TRESOR, *Chemist in charge.*

Nitrogen determinations for all laboratories of this bureau, as well as for many of the other bureaus of the department, are made in the nitrogen laboratory. Work in cooperation with the Association of Official Agricultural Chemists is also done, looking to the improvement of the methods for making these determinations. H. W. Daudt, assistant.

Organic Investigation Laboratory. I. K. PHELPS, *Chemist in charge.*

This laboratory is conducting investigations in organic chemistry necessary in the enforcement of the food and drugs act. The chief problem engaging it at present is the development of chemical methods for the detection of deterioration and spoilage in foods.

Scientific staff.—L. H. Almy and G. A. Geiger, assistants.

Pharmacognosy Laboratory. A. VIEHOEVER, *Pharmacognosist in charge.*

This laboratory supervises the inspection of crude drugs under the food and drugs act. It carries out the necessary microscopical and chemical investigations of such drugs. C. D. Mell, assistant.

Pharmacological Laboratory. W. SALANT, *Pharmacologist in charge.*

This laboratory makes researches on the physiological action of poisonous substances occurring in food products and of drugs used as medicine, and physiological tests of drugs to ascertain the strength and purity of medicinal preparations found in the open market.

Scientific staff.—S. Hecht, J. B. Rieger, and C. S. Smith, assistants.

Plant Chemical Laboratory. J. A. LE CLERC, *Chemist in charge.*

The plant chemical laboratory studies the chemistry of plants, with respect especially to climate and environment, both in the greenhouse and in the field; changes taking place in grain during germination, malting, and storage; starch obtained from different sources for technical and food purposes; milling and breadmaking and the drying of potatoes. Work is also done in collaboration with the Bureau of Plant Industry on problems connected with plant-physiological chemistry.

Scientific staff.—L. H. Bailey, J. F. Breazeale, J. Davidson, M. G. Mastin, and H. L. Wessling, assistants.

Field Investigation Service.**Enological Laboratory.** WILLIAM B. ALWOOD, *in charge.*

This laboratory studies (1) alcoholic ferments and the malorganisms associated with them in fruit musts, ciders, wines, and fruit by-products and (2) the composition of fruits and fruit juices, their fermented products, and the residue which is left in the marc or pomace. J. O. Carrero, assistant.

Food Research Laboratory, M. E. PENNINGTON, *in charge.*

The food research laboratory makes chemical, bacteriological, and histological studies of foods preserved by low temperatures. Milk, poultry, and eggs have been the objects of investigation, with reference to their decomposition and putridity during preparation, transportation, storage, and marketing, in connection with the food and drugs act. A special investigation of frozen and dried eggs and egg products has been carried on, chiefly in the egg-breaking establishments, and with the cooperation of the industry.

Scientific staff.—E. D. Clark, E. L. Connolly, A. D. Greenlee, N. Hendrickson, J. S. Hepburn, J. M. Humble, M. Jenkins, H. A. McAleer, H. C. Pierce, and E. Witmer, assistants.

Field Regulatory Service.**Food and Drug Inspection.**

The country has been divided into three food and drug inspection districts, Eastern, Central, and Western, each with a chief in charge, who has immediate supervision of the branch laboratories and the inspectors within his district. The Eastern Inspection District (W. G. Campbell, chief, Washington, D. C.) includes the laboratories in Boston (A. L. Sullivan, chief), Buffalo (W. L. Dubois, chief), New York (R. E. Doolittle, chief), Philadelphia (C. S. Brinton, chief), San Juan (A. E. Taylor, acting chief), Savannah (W. C. Burnet, chief), and Washington (W. J. McGee, chief). The Central Inspection District (L. M. Tolman, chief, Chicago) includes the laboratories in Chicago (G. W. Hoover, chief), Cincinnati (—, chief), New Orleans (F. W. Liepsner, chief), St. Louis (D. B. Bisbee, chief), and St. Paul (E. H. Goodnow, chief). The Western Inspection District (B. R. Hart, chief, San Francisco) includes the laboratories in Denver (R. S. Hiltner, chief), Honolulu (A. W. Hansen, chief), San Francisco (R. W. Hilt, chief), and Seattle (A. L. Knisely, chief). There is a corps of 43 food and drug inspectors in the field. The taking of samples for analysis constitutes their chief duty, though special investigations in collaboration with the chemists are also made, and factories are inspected in which food and drugs are prepared. Examinations of samples are made for other branches of the Government service as may be necessary.

State Officials authorized to collect samples under the food and drugs act.

Alabama.—R. F. Kolb, Commissioner of Agriculture and Industries, Montgomery. *Arizona.*—Charles A. Meserve,¹ Director of State Laboratory, University of Arizona, Tucson. *Arkansas.*—Morgan Smith, State Health Officer, Little Rock. *California.*—Martin Regensburger, State Board of Health, Berkeley. *Colorado.*—John Lynch, State Board of Health, Denver. *Connecticut.*—H. F. Potter, Dairy and Food Commissioner, Capitol Building, Hartford. *Delaware.*—A. E. Frantz, State Board of Health, Wilmington. *District of Columbia.*—William C. Woodward, Health Department, Washington, D. C. *Georgia.*—J. D. Price, Department of Agriculture, Atlanta. *Idaho.*—James H. Wallis, Department of Food, Drug, and Hotel Inspection, Boise. *Illinois.*—W. Scott Matthews, Food Commission, 1627 Manhattan Building, Chicago. *Indiana.*—H. E. Barnard,¹ State Board of Health, Statehouse, Indianapolis; W. J. Jones, jr.,² Purdue University, Lafayette. *Iowa.*—W. B. Barney, Dairy and Food Commission, Des Moines. *Kansas.*—S. J. Crumrine, State Board of Health, Topeka; L. A. Fitz,² State Agricultural College, Man-

¹ Authorized to collect samples by virtue of appointment as collaborating chemist.

² Authorized to collect samples of feeds and feeding stuffs.

hattan. *Kentucky*.—R. M. Allen, Food and Drug Department, Agricultural Experiment Station, Lexington. *Louisiana*.—Oscar Dowling, State Board of Health, New Orleans. *Maine*.—John A. Roberts, Department of Agriculture, Augusta. *Massachusetts*.—Henry P. Walcott, State Board of Health, Boston, Philip H. Smith,² Agricultural Experiment Station, Amherst. *Michigan*.—James W. Helme, Dairy and Food Department, Lansing. *Minnesota*.—Joel G. Winkler, Dairy and Food Department, St. Paul. *Mississippi*.—W. F. Hand,¹ Agricultural and Mechanical College, Agricultural College. *Missouri*.—F. H. Fricke, Food and Drug Department, La Salle Building, St. Louis. *Montana*.—W. F. Cogswell, Department of Public Health, Helena. *Nebraska*.—Clarence E. Harman, Food, Drug, Dairy, and Oil Commission, Lincoln. *Nevada*.—Sanford C. Dinsmore,¹ Agricultural Experiment Station, Reno. *New Hampshire*.—Irving A. Watson, State Board of Health, Concord. *New Jersey*.—R. B. Fitz-Randolph,¹ State Board of Health, Trenton. *New York*.—Calvin J. Huson, Department of Agriculture, Albany. *North Carolina*.—W. A. Graham, Department of Agriculture, Raleigh. *North Dakota*.—Edwin F. Ladd,¹ Agricultural Experiment Station, Agricultural College. *Ohio*.—S. E. Strode, Dairy and Food Department, Columbus. *Oklahoma*.—Edwin De Barr,¹ State Board of Health, Norman; L. McLennan,² Board of Agriculture, Oklahoma City. *Oregon*.—J. D. Mickle, Dairy and Food Commission, 510 Worcester Building, Portland. *Pennsylvania*.—James Foust, Department of Agriculture, Harrisburg. *Porto Rico*.—W. F. Lippitt, Service of Sanitation, P. O. Box 1108, San Juan. *South Carolina*.—E. J. Watson, Department of Agriculture, Commerce, and Industries, Statehouse, Columbia. *South Dakota*.—Guy G. Frary, Department of Food and Drugs, Vermilion. *Tennessee*.—Lucius P. Brown,¹ Department of Food and Drugs, Nashville. *Texas*.—C. O. Yates, Food and Drug Department, Austin; B. Youngblood,² Agricultural Experiment Station, College Station. *Utah*.—Willard Hansen, Dairy and Food Department, 508 Walker Building, Salt Lake City. *Vermont*.—Charles F. Dalton, State Board of Health, 184 Church Street, Burlington. *Virginia*.—William D. Saunders, Department of Agriculture and Immigration, Richmond. *Washington*.—J. J. Higgins, Department of Agriculture, Olympia. *Wyoming*.—Maurice Groshon, Dairy, Food, and Oil Department, Cheyenne.

BUREAU OF SOILS.

Soil Physicist and Chief of Bureau, MILTON WHITNEY; *Chief Clerk*, A. G. RICE.

The Bureau of Soils investigates the relation of soils to climate and organic life; studies the texture and composition of soils in field and laboratory; maps the soils; studies the cause and means of preventing the rise of alkali in the soils of irrigated districts, and the relations of soils to seepage and drainage conditions.

The bureau prepares annually the report of the Field Operations of the Bureau of Soils, which contains a detailed description of the soils and of the agricultural conditions of the various areas surveyed, points out the present use of the soils, and discusses the possible changes and improvements in crops and methods of cultivation. Large-scale lithographic maps showing the distribution of the different kinds of soils accompany each report.

Laboratories. FRANK K. CAMERON, *Scientist in charge*.

The laboratories investigate the chemical properties of soils in their relation to plant growth; make chemical analysis of soil types and study their requirements with regard to fertilizers; investigate alkali problems; and direct the chemical methods used by field parties. Investigations are in progress regarding the occurrence and extent of natural deposits and of industrial by-products containing fertilizer constituents and the extraction and utilization of these constituents.

The laboratories also investigate the physical properties of soils and their economic bearing; make physical examination and mechanical analysis of soil types for soil-survey parties; prepare and test apparatus used in field work; and investigate from a physical standpoint such mechanical soil problems as arise.

Scientific staff.—J. W. Bombay, H. Bryan, J. A. Cullen, R. O. E. Davis, C. C. Fletcher, Paul J. Fox, W. H. Fry, R. F. Gardiner, Sanders M. Johnson, Benjamin A. Judkins, J. R. Lindemuth, A. R. Merz, C. F. Miller, L. B. Olmstead, W. B. Page, E. G. Parker, W. O. Robinson, W. H. Ross, J. G. Smith, L. A. Steinkoenig, J. W. Turrentine, and W. H. Waggaman.

Soil Survey. CURTIS F. MARBUT, *Scientist in charge*.

The Soil Survey surveys and maps the soils in selected areas in various parts of the United States; correlates the soils of different parts of the country and establishes their scientific classification; and locates, maps, and classifies the soils of agricultural-school farms and experiment-station farms, in cooperation with various State organizations.

Scientific staff.—Southern division, H. H. Bennett, in charge. Northern division, W. E. McLendon and T. D. Rice, in charge. Western division, Macy H. Lapham, in charge. Use of soils, J. A. Bonsteel, in charge; J. E. Lapham, scientist.

J. H. Agee, R. T. Allen, Mark Baldwin, Miles W. Beck, R. T. A. Burke, T. N. Bushnell, W. T. Carter, jr., W. B. Cobb, L. V. Davis, E. B. Deeter, Bruce B. Derrick, J. B. R. Dickey, J. E. Dunn, E. C. Eckmann, W. J. Geib, B. D. Gilbert, A. L. Goodman, E. C. Hall, R. B. Hardison, George L. Harrington, H. W. Hawker, W. H. Heileman, L. C. Holmes, L. A. Hurst, F. Z. Hutton, G. B. Jones, J. A. Kerr, N. M. Kirk, A. E. Koehler, W. J. Latimer, H. G. Lewis, C. Lounsbury, A. W. Mangum, E. T. Maxon, A. H. Meyer, C. N. Mooney, T. M. Morrison, A. L. Patrick, R. F. Rogers, L. A. Schoenmann, E. H. Smies,

¹ Authorized to collect samples by virtue of appointment as collaborating chemist.

² Authorized to collect samples of feeds and feeding stuffs.

H. C. Smith, W. G. Smith, J. M. Snyder, Edmund H. Stevens, A. T. Strahorn, A. T. Sweet, A. E. Taylor, W. E. Tharp, B. W. Tillman, E. S. Vanatta, C. VanDuyne, J. O. Veatch, C. S. Waldrop, E. B. Watson, H. J. Wilder, and R. A. Winston, assistants in the soil survey.

Fertility Investigations. OSWALD SCHREINER, *Scientist in charge.*

The Division of Fertility Investigations studies the causes of and remedy for infertility in certain soils, whether natural or arising from improper methods of cultivation and cropping. It separates, identifies, and studies certain organic substances found in unproductive soils, and corrects their evil effects by mechanical handling, by the use of fertilizers, and by other methods available to the farmer.

Scientific staff.—J. H. Beattie, B. E. Brown, L. J. Gillespie, A. M. Jackson, E. C. Lathrop, F. R. Reid, E. C. Shorey, J. J. Skinner, M. X. Sullivan, E. H. Walters, and H. Winckelmann, assistants.

BUREAU OF ENTOMOLOGY.

Entomologist and Chief, L. O. HOWARD; *Entomologist and Acting Chief in absence of Chief,* C. L. MARLATT; *Executive Assistant,* R. S. CLIFTON.

The Bureau of Entomology studies insects; experiments with the introduction of beneficial insects; makes tests with insecticides and insecticide machinery; and identifies insects sent in by inquirers.

Investigations of Insects Affecting Southern Field Crops. W. D. HUNTER, *in charge.*

These investigations deal with insect pests of cotton, tobacco, sugar cane, and rice, and are planned so as to reveal practical methods of control. Special attention is given to the Mexican cotton-boll weevil and its parasitic enemies.

Cereal and Forage Insect Investigations. F. M. WEBSTER, *in charge.*

The alfalfa weevil, the range caterpillar, the chalcis fly, the alfalfa caterpillar, the alfalfa gall midge, the fall army worm, a new wireworm attacking corn, the corn leaf aphid, the chinch bug, and the Hessian fly are all objects of these investigations. A study of the white grub covers about 20 States. Other insects studied are the southern corn leaf-beetle, false wireworms, the western army cutworm, jointworms, the western corn rootworm, and wireworms. Several entirely new pests to corn, cowpeas, and soy beans are being studied. Fully equipped field stations, manned with trained investigators, are distributed over the country.

Investigations of Insects Affecting Deciduous Fruits. A. L. QUAINANCE, *in charge.*

Insects injurious to orchards, vineyards, nut trees, etc., are studied in this work. Field laboratories are maintained for a series of years in important fruit regions. Demonstrations of the use of insecticides and spraying apparatus are made on a commercial scale. Important projects include investigations of grape insects, the codling moth, cranberry insects, the pear thrips, pecan insects, orchard plant lice, and scale insects.

Investigations of Insects Affecting Tropical and Subtropical Fruits. C. L. MARLATT, *in charge.*

Insects affecting the citrus fruits, olive, fig, and all other tropical and subtropical fruits, as well as the use of hydrocyanic-acid gas and other means of controlling the white fly in Florida and citrus-scale insects in California, are studied in this work.

Truck-Crop and Stored-Product Insect Investigations. F. H. CHITTENDEN, *in charge.*

Field studies of insects affecting vegetable and truck crops are being made in nine States. Projected work includes the control of cutworms and onion, sugar beet, cabbage, cauliflower, asparagus, bean, and pea insects. Studies of hop and mushroom insects are also under way. Among stored products attacked by insects (such as cereals, seeds, dried fruits, nuts, tobacco, meat products, and various fabrics), a special study is being made of export flour from the Gulf region, with similar work for peanuts. New remedies for various pests are being tried.

Forest-Insect Investigations. A. D. HOPKINS, *in charge.*

Field investigations of insects attacking forest trees and forest products, with a view to practical methods of preventing losses, are extended into every State. Demonstration of the value of results already attained is attempted through cooperation with private owners and forest officers.

Investigations of Insects Affecting Shade Trees and Ornamental Trees. Under direction of the Entomologist.

These investigations include the economic treatment of borers, tree defoliators, scales, aphides, and other insects affecting trees in parks and streets, as well as ornamental plants.

Insects Affecting the Health of Man and Animals. Under immediate direction of the Entomologist.

This field covers the relation between certain mosquitoes and malaria and yellow fever, the house fly and typhoid fever, and the stable fly and infantile paralysis, as well as the possible relation between insects and pellagra. The investigation also deals with insects as internal and external parasites of animals and seeks practical methods for their control. A number of pests affecting domestic animals, including the cattle tick, are being studied.

Investigations in Bee Culture. E. F. PHILLIPS, *in charge.*

The structure, development, and behavior of the bee are being investigated. Special attention is given to methods of wintering, with chief emphasis at present on the proper temperature of the bee cellar. Bee diseases are being thoroughly studied. The ultimate object is to furnish helpful information to the bee-keeper.

Gipsy Moth and Brown-Tail Moth Investigations. A. F. BURGESS, *in charge*.

A large field force is maintained in New England in the effort to prevent the spread of these two moths. A laboratory is maintained for the assemblage, study, and liberation of imported parasites of these moths; the work of the parasites is studied in the field.

Miscellaneous Investigations. Under immediate direction of the Entomologist.

Identification of material sent in and classification and care of museum material, the study of household insects, and the importation and exchange of useful species are instances of work coming under this head.

BUREAU OF BIOLOGICAL SURVEY.

Chief, HENRY W. HENSHAW; *Assistant Chief*, T. S. PALMER.

The work of the Bureau of Biological Survey is distributed among three divisions, dealing with the following matters: (1) Study of birds and mammals in their relation to agriculture, their food habits, etc., and recommendation of measures for the preservation of beneficial species and the destruction of harmful species; A. K. Fisher, *in charge*. (2) Making biological surveys, study of geographic distribution of animals and plants, and mapping natural life zones; E. W. Nelson, *in charge*. (3) Carrying into effect the Federal laws protecting game, regulating the importation of foreign birds and animals, and protecting migratory birds; T. S. Palmer, *in charge*.

DIVISION OF ACCOUNTS AND DISBURSEMENTS.

Chief of Division and Disbursing Clerk, A. ZAPPONE.

This division has charge of the disbursement of public funds appropriated for the Department of Agriculture.

Cashier's Section. W. J. NEVIUS, *Cashier and Chief Clerk, in charge*.

This section prepares and mails all checks and handles all moneys received and disbursed.

Bookkeeper's Section. F. W. LEGGE, *Accountant and Bookkeeper, in charge*.

This section keeps the books pertaining to the fiscal affairs of the department, prepares requisitions on the Treasury for advance of public funds, and compiles quarterly abstracts of expenditures and collections and an account current covering the liability for public funds.

Examining Section. EVERETT D. YERBY, *Supervising Auditor, in charge*.

This section examines all accounts before payment.

DIVISION OF PUBLICATIONS.

Editor and Chief, JOS. A. ARNOLD; *Editor and Assistant Chief*, B. D. STALLINGS; *Chief Clerk*, A. I. MUDD.

The Division of Publications conducts all business of the department transacted with the Government Printing Office; has general supervision of all printing, including the editing, indexing, illustration, binding, and distribution of publications, and the maintenance of mailing lists.

Editorial Work. B. D. STALLINGS, *Editor and Assistant Chief, in charge*.

This work includes editing manuscripts and giving directions for printing, correcting proofs, and inspecting completed work.

Editorial corps.—R. B. Handy, Ephraim Cornman, William F. Harding, George W. Kennedy, Stanley Searles, T. K. Burrows, Delos M. Carter, and R. S. Moore, assistant editors.

Indexing. CHARLES H. GREATHOUSE, *Assistant Editor in charge*.

Two kinds of indexes are made: (1) Indexes to be printed with individual publications; (2) a general card index, by subjects, of all publications of the department. Congressional documents are obtained for department officials, and the Congressional Record is marked daily for their attention.

Principal assistants.—Ed. S. Hoskins, Laura B. Lawson, Mary A. E. Smith, and M. M. Moseley.

Illustrations. A. B. BOETTCHER, *Assistant in charge*.

Drawings and photographs are made for use in illustrating publications and also for use in the various branches of the department's work. Photographic prints and lantern slides are sold to the public.

Document Section. FRANCIS J. P. CLEARY, *Assistant in charge*.

This section receives and distributes the publications designed for departmental use; mails circulars and documents not intended for public distribution; furnishes mailing lists and makes orders upon the Public Printer for the mailing of publications intended for the public; specifies the publications to be sent in response to miscellaneous requests; prepares correspondence relating to the publications and keeps all records of the distribution, including the Congressional quotas of Farmers' Bulletins; addresses franks and envelopes, and prepares addresses for mailing lists, of which a general index is kept up to date; and duplicates official circulars, as well as the information prepared for the press.

BUREAU OF STATISTICS.

(Bureau of Agricultural Forecasts.)

Statistician and Chief of Bureau, LEON M. ESTABROOK; *Assistant Statistician and Acting Chief in absence of Chief*, NAT C. MURRAY; *Assistant Statistician and Assistant Chief of Bureau*, SAMUEL A. JONES; *Chief Clerk*, FRANK G. KELSEY.

The Bureau of Statistics (Bureau of Agricultural Forecasts) issues the monthly crop reports of the department, prepares the statistical portion of the Yearbook of the Department of Agriculture, and makes special investigations relating to agricultural forecasts and estimates for publication or in response to special inquiries.

Crop Reporting Board.

Monthly crop estimates for important crops are made by a Crop Reporting Board, consisting of the chief of bureau, as chairman, and four other members selected from the officials and agents of the bureau. The estimates are based on reports from four independent sources, namely, (1) field agents, (2) State statistical agents, (3) county correspondents, and (4) township correspondents; of the latter there are many thousands. For cotton, reports are received also from (5) ginner, (6) a special list, mostly bankers, supply men, etc., and (7) individual farmers reporting for their own farms.

Division of Forecasts.

The Division of Forecasts receives the reports of the various classes of crop correspondents and tabulates them for the use of the Crop Reporting Board. The reports of correspondents are sent in on blank schedules furnished them by this division, which also keeps the ranks of the correspondents filled up.

Field Service.

The service outside of Washington consists of 22 special field agents, 47 State statistical agents, and about 150,000 voluntary correspondents. The special field agents keep in close touch with the best-informed opinion throughout their districts. The State statistical agents maintain special corps of correspondents.

Division of Estimates.

The Division of Estimates continues the work after harvest that was carried on by the Forecast Division during the crop season. It collates information on agricultural production in form available for farmers and others. The statistical portion of the Yearbook is prepared here. A well-equipped library of agricultural statistics is maintained.

LIBRARY.

Librarian, CLARIBEL R. BARNETT; Assistant Librarian, EMMA B. HAWES.

The department library contains approximately 130,000 books and pamphlets, including an extensive collection on agriculture and all its branches, a large and representative collection on the sciences related to agriculture, and a good collection of standard reference books. Periodicals currently received number 1,950. A dictionary catalogue is kept on cards, which number about 310,000. The librarian has charge of the foreign mailing lists for department publications.

OFFICE OF EXPERIMENT STATIONS.

Director, A. C. TRUE; Assistant Director, E. W. ALLEN; Chief Clerk, MRS. C. E. JOHNSTON; Librarian, Miss E. L. OGDEN.

In all lines of its work the Office of Experiment Stations cooperates with the State agricultural colleges and experiment stations.

Relations with Institutions for Agricultural Research. *E. W. ALLEN, Assistant Director and Editor of Experiment Station Record.*

Under this head the office is broadly organized to give the State agricultural experiment stations such advice and assistance as will best promote their efficiency. It also collects and disseminates information regarding similar institutions throughout the world. Among its activities in relation to the stations are the following:

Inspection of work and expenditures of the State experiment stations.—The office supervises the expenditures of the Federal funds granted to the State agricultural experiment stations under the acts of Congress of March 2, 1887, and March 16, 1896. This work is assigned especially to the Director, the Assistant Director, W. H. Beal, Walter H. Evans, and J. I. Schulte.

Experiment Station Record.—The office publishes the Experiment Station Record, a periodical which gives abstracts of the bulletins and annual reports of the experiment stations, of the publications of the Department of Agriculture, and of publications reporting investigations in agricultural science in the different countries of the world. The Record contains also editorials and notes bearing upon station work. The staff of the Record is as follows: Assistant editor, H. L. Knight; agricultural chemistry and agrotechny, L. W. Fetzer; meteorology, soils, and fertilizers, W. H. Beal and R. W. Trullinger; agricultural botany, bacteriology, and vegetable pathology, W. H. Evans and W. E. Boyd; field crops, J. I. Schulte and G. M. Tucker; horticulture and forestry, E. J. Glasson; foods and human nutrition, C. F. Langworthy and H. L. Lang; zootechny, dairying, and dairy farming, Hugh Webster; economic zoology and entomology, W. A. Hooker; veterinary medicine, W. A. Hooker and L. W. Fetzer; rural engineering, R. W. Trullinger; rural economics, Eugene Merritt; agricultural education, C. H. Lane; indexer, M. D. Moore.

Editorial Division. *W. H. Beal, Chief.*

With the exception of the Experiment Station Record, this division edits the publications of the Office of Experiment Stations. These include the annual report of the office, reports of investigations made by the several branches of the office, an extensive card index of experiment station literature, and miscellaneous documents.

Division of Insular Experiment Stations. *WALTER H. EVANS, Chief.*

The experiment stations in Alaska, Hawaii, Porto Rico, and Guam are conducted under the general direction of this division.

Alaska Agricultural Experiment Stations. C. C. GEORGESON, *Sitka, Special Agent in charge.*

The main station in Alaska is at Sitka. Investigations are also carried on at Rampart, in the Yukon Valley; at Kodiak; and at Fairbanks, in the valley of the Tanana River. The work consists of field experiments with vegetables, cereals, and forage plants; horticultural investigations; the maintenance of livestock; the curing of hay and silage; the distribution of seeds; and an agricultural survey of the Territory.

Assistants.—J. P. Anderson, Sitka; G. W. Gasser, Rampart; M. D. Snodgrass, Kodiak; J. W. Neal, Fairbanks.

Hawaii Agricultural Experiment Station. E. V. WILCOX, *Honolulu, Special Agent in charge.*

Investigations of the Hawaii Agricultural Experiment Station deal with such crops as cotton, tobacco, rice, forage crops, fiber, and horticultural plants, with plant diseases, and with insects. In cooperation with the Hawaiian Government, demonstration farms have been established on the larger islands.

Staff.—D. T. Fullaway, entomologist; J. E. Higgins, horticulturist; C. J. Hunn and V. S. Holt, assistants in horticulture; W. P. Kelley, chemist; W. T. McGeorge and Alice R. Thompson, assistant chemists; C. A. Sahr, assistant in agronomy.

Porto Rico Agricultural Experiment Station. D. W. MAY, *Mayaguez, Special Agent in charge.*

Investigations of this station relate especially to the growing of coffee, field crops, and horticultural plants, the development of animal industry and dairying, soils, vegetable pathology, and entomology.

Staff.—P. L. Gile, chemist; C. F. Kinman, horticulturist; T. B. McClelland, assistant in horticulture; G. L. Fawcett, plant pathologist, and R. H. Van Zwaluwenburg, entomologist.

Guam Agricultural Experiment Station. A. C. HARTENBOWER, *Guam, Agent in charge;* L. B. BARBER, *Veterinarian and Animal Husbandman;* P. NELSON, *Assistant.*

The station in Guam is located near Agana, the principal town. Experiments are being conducted in improved methods of cultivation, introduction and improvement of tropical agricultural crops, and introduction of improved live stock.

Relations with Agricultural Colleges and Schools. C. H. LANE, *Chief Specialist in Agricultural Education.*

Information regarding the agricultural colleges and schools is collated in this office, which aims to promote the interests of agricultural education, especially the introduction of agricultural instruction into secondary and elementary schools.

Staff.—E. A. Miller, Eugene Merritt, and C. H. Hanson, assistants; D. J. Crosby, collaborator.

Relations with Farmers' Institutes. J. M. STEDMAN, *Farmers' Institute Specialist.*

This branch reports upon the progress of farmers' institutes and aids in making them more effective for the dissemination of the knowledge of agricultural research and improved agricultural practice. It also aids in establishing movable schools and other forms of extension work for adults.

Nutrition Investigations. C. F. LANGWORTHY, *Chief;* R. D. MILNER, *Assistant.*

These investigations deal with the nutritive value of agricultural products used for human food, with special attention to their more effective utilization.

Staff.—S. C. Clark, W. P. Garrety, A. D. Holmes, and H. L. Lang, assistants in nutrition laboratory; Caroline L. Hunt and Helen W. Atwater, expert assistants.

Irrigation Investigations. SAMUEL FORTIER, *Chief.*

The Irrigation Investigations deal with (1) laws and institutions affecting irrigation; (2) the best use of irrigation water; (3) the best methods of bringing water to the place of use and applying it to crops; (4) pumping devices, their efficiency in irrigation, and possibility of their improvement; (5) use and value of various irrigation structures and devices.

Staff.—R. P. Teele, irrigation economist; Fred G. Harden, investigations of canal enterprises; Paul A. Ewing, executive assistant; Frank Huntington, editorial clerk. In charge of field work: A. P. Stover, western Oregon; C. E. Tait, southern California; S. O. Jayne, Washington; Frank Adams, California; W. W. McLaughlin, Utah; P. E. Fuller, Arizona, and power investigations; W. L. Rockwell, Texas; Don H. Bark, Idaho; Milo B. Williams, humid section; C. G. Haskell, rice investigations; R. D. Robertson, central California; V. M. Cone, Colorado; F. L. Bixby, New Mexico; John Gordon, Wyoming; Fred C. Scobey, special investigations of conveyance of water; S. T. Harding, Montana and North Dakota; H. W. Grunsky, Oregon; F. W. Stanley, South Atlantic States; F. L. Peterson, Nevada; and H. C. Diesem, semiarid States. H. E. Murdock, special investigations. Collaborators: W. B. Gregory, pumping plants and canals for rice irrigation; and S. H. Beckett, California. Irrigation farmers: R. G. Hemphill and R. E. Mahoney. Assistant irrigation engineers: Justin T. Kingdon, Reuben B. Sleight, Frank J. Velhmeyer, and James C. Marr.

Drainage Investigations. S. H. MCCRORY, *Chief.*

The Drainage Investigations embrace the following subjects: (1) Methods of removing surplus water from lands having agricultural value; (2) protection of lands from periodical overflow of streams; (3) reclamation of tidal lands; and (4) control and conservation of rainfall on hillside lands.

Staff.—Office engineers, R. D. Marsden, A. D. Morehouse, and H. H. Barrows; draftsmen, Will D. Nichols, J. G. Hanford, and Robert G. Green; senior clerk, H. S. Yohe; drainage engineers, H. A. Kipp, S. W. Frescoln, O. G. Baxter, G. M. Warren, D. L. Yarnell, J. V. Phillips, Lewis A. Jones, F. G. Eason, Chas. W. Okey, J. R. Haswell, H. M. Lynde, F. F. Shafer, and A. G. Hall; supervising drainage engi-

neer of irrigated lands, R. A. Hart; drainage engineers for irrigated lands, D. G. Miller, W. W. Weir, Sidney W. Cooper, W. A. Kelly, W. N. Hall, and W. G. Sloan; assistant drainage engineers, C. E. Ramser, Harry G. Hawley, Louie T. Jessup, David E. Helzer, Guy A. Hart, and D. F. Culbertson; engineers available for special work, S. M. Woodward, John T. Stewart, and W. B. Gregory.

OFFICE OF PUBLIC ROADS.

Director, LOGAN WALLER PAGE; *Assistant Director*, P. ST. J. WILSON; *Chief Clerk*, W. CARL WYATT;
Editorial Clerk and Librarian, WILLIAM W. SNIFFIN.

The Office of Public Roads studies systems of road management and methods of road building, improvement, and maintenance; details engineers to assist local officials in building model roads; ascertains the location, properties, and value of road materials; builds experimental roads to test substitutes for natural road materials; conducts a one-year post-graduate course in highway engineering; investigates the comparative effects of motor and horse traffic on roads; cooperates with colleges and stations and with State highway officials; exhibits models showing types of roads, culverts, bridges, and road machines; and cooperates with the Post Office Department in carrying out the provisions of the Post Office appropriation act of August 24, 1912, relating to the improvement of post roads; and with the Forest Service on road work done with the proceeds of the 10 per cent appropriation from their receipts; and cooperates with the Department of the Interior in the improvement of roads in the national parks.

Road Management Investigations. J. E. PENNYBACKER, *Chief, Division of Road Economics, in charge.*

This work covers general statistical and research investigations; the economic study of highway systems; studies of accounting and cost keeping; compilation and advice upon road legislation; traffic census; lectures, and demonstration of road and bridge models; instruction of students in highway engineering; the maintenance of a State index containing information in concise form with reference to road matters throughout the United States; the employment of a corps of State collaborators, one in each State; and the giving of expert advice in line with the foregoing projects.

Scientific staff.—M. O. Eldridge, assistant in road management; A. S. Brainard, senior highway engineer; George D. Marshall, superintendent of road construction; L. E. Boykin, assistant in road economics; H. W. Hendley, model maker; A. P. Anderson, highway engineer; Thomas E. Stokes, assistant in road economics; James J. Tobin, assistant in road economics.

Road Building and Maintenance Investigations. VERNON M. PEIRCE, *Chief Engineer, in charge of construction*; E. W. JAMES, *Chief, Division of Road Maintenance, in charge of maintenance work*; T. WARREN ALLEN, *Chief, Division of National Park and Forest Roads, in charge of the improvement of roads in National Parks and Forest Reserves*; OSCAR L. GROVER, *Senior Structural Engineer, in charge of bridge work.*

These investigations cover the building of object-lesson and post roads, and object-lesson bridges; the development of county road systems; making inspections and giving expert advice on road and bridge construction; the superintendence of county roads; the making of road surveys; the instruction of students in highway engineering; systems of road maintenance; the maintenance of object-lesson, experimental, and post roads; the construction of roads within the National Parks and Forest Reserves in cooperation with the Department of the Interior and with the Forest Service; the preparation of typical plans for highway bridges and culverts; and experiments with bridge materials.

Scientific staff.—H. L. Arbenz, B. H. Burrell, W. F. Brooks, W. A. Crossland, O. W. Childs, J. D. Fauntleroy, E. O. Hathaway, B. F. Heidel, L. I. Hewes, C. H. Kendall, H. H. Lotter, W. H. Lynch, G. C. Scales, J. F. Schuyler, W. L. Spoon, R. E. Toms, J. T. Voshell, J. A. Whittaker, and J. C. Wonders, senior highway engineers; C. H. Moorefield, C. C. Morris, H. K. Craig, H. S. Fairbank, J. W. Janssen, O. N. Powell, W. H. Rhodes, jr., W. E. Rosengarten, J. R. Shidler, C. R. Thomas, W. J. R. Weir, and M. E. Worrell, highway engineers; E. S. Alderman, R. H. Harrison, H. S. Parry, P. A. Rideout, and L. L. Winans, junior highway engineers; J. H. Dodge, D. G. Haire, C. T. Harrison, H. C. Wells, and D. H. Winslow, superintendents of road construction; T. L. Ainsworth and O. P. Solem, draftsmen; F. A. Davis, Mack Gallbreath, A. S. Hathaway, jr., W. R. Overton, J. T. Pauls, R. E. Royall, S. L. Taylor, and W. M. J. Lewis, civil engineer students.

Road Material Investigations. E. B. McCORMICK, *Mechanical Engineer, in charge of physical laboratory*, and C. S. REEVE, *Chemist, in charge of chemical laboratory.*

These investigations cover the routine chemical testing and inspecting of dust preventives and road binders and materials allied to road construction; microscopic examination and classification of road-building rocks; research on properties of dust preventives and road binders; standardization of methods of testing bituminous road materials, experimental bituminous road construction and maintenance; instruction of students in highway engineering; physical testing of road-building materials; concrete road and bridge investigations; nonbituminous road materials investigations; standardization of tests on nonbituminous road materials; and instrument making and repairing.

Scientific staff.—Earl B. Smith, associate mechanical engineer; L. L. Beebe, Morgan Cilley, and Elmer Johnson, assistant mechanical engineers; F. H. Jackson, jr., laboratory assistant; J. P. Nash, laboratory apprentice; E. C. E. Lord, petrographer; F. P. Pritchard, B. A. Anderton, and R. H. Lewis, assistant chemists.

Field Experiments. VERNON M. PERCE, *Chief Engineer, in charge of construction*, and E. B. McCORMICK, *Mechanical Engineer, in charge of traction tests*.

This work comprises the construction of high-class roads in cooperation with some local administrative unit having funds available for the purpose of demonstrating the best methods of constructing the more advanced types of roads and of studying the action of these roads under known conditions of traffic, and investigations concerning various road materials and preparations, investigating and developing equipment intended for the preparation and application of bituminous and other binders; and the conduct of traction tests in order to determine the respective resistances of various road surfaces, and the relative values of wide and narrow tires, of different diameters of wheels, width of tread, together with the effect of grade and method of hitching on the effort that may be exerted by horses; also to determine the effect both on the draft required and on the road surface of increasing the load beyond certain limits.

Scientific staff.—Various members of the force of highway engineers, mechanical engineers, chemists, and civil engineer students in the office.

ADVISORY BOARDS.

Referee Board of Consulting Scientific Experts.

The referee board was created February 24, 1908. It now consists of the following members: Dr. Ira Remsen, president of Johns Hopkins University, chairman; Dr. Russell H. Chittenden, professor of physiological chemistry in Yale University and director of the Sheffield Scientific School; Dr. John H. Long, professor of chemistry in the Northwestern University Medical School; Dr. Alonzo E. Taylor, Benjamin Rush professor of physiological chemistry in the University of Pennsylvania; and Dr. Theobald Smith, professor of comparative pathology in Harvard University. The board considers such questions arising in the enforcement of the food and drugs act of June 30, 1906, as may be referred to it by the Secretary of Agriculture.

Committee on Buildings of the Department of Agriculture.

This committee supervises any necessary changes in department buildings, advises as to proper management of new buildings, rented quarters, etc., and considers bids pertaining to buildings.

Members.—R. M. Reese, Chief Clerk of the department, chairman; Leon M. Estabrook, Chief of Bureau of Statistics; and James E. Jones, Chief Clerk of Bureau of Plant Industry.

Insecticide and Fungicide Board.

The Insecticide and Fungicide Board, created December 22, 1910, assists the Secretary of Agriculture in the enforcement of the insecticide act of 1910.

Members.—J. K. Haywood, chairman; M. B. Waite, A. L. Quaintance, and James A. Emery; executive officer, J. G. Shibley.

Board of Awards.

The Board of Awards opens, examines, and reports upon informal bids and proposals for furnishing supplies and for performing services for the department (except for the Weather Bureau and the Committee on Buildings).

Members.—R. M. Reese, Chief Clerk of the department, chairman; C. C. Carroll, Chief Clerk, Bureau of Animal Industry; F. E. Meloy, Property Clerk, Bureau of Plant Industry.

Federal Horticultural Board.

The Federal Horticultural Board, created August 21, 1912, assists the Secretary of Agriculture in the enforcement of the plant quarantine act of August 20, 1912.

Members.—C. L. Marlatt, chairman; W. A. Orton, vice chairman; George B. Sudworth, W. D. Hunter, and A. V. Stubenrauch; R. C. Althouse, secretary of board.

Committee on the Editing of the Journal of Agricultural Research.

The Journal of Agricultural Research publishes technical papers giving the results of the various lines of research carried on by the department. The selection of the papers and the conduct of the Journal are intrusted to this committee.

Members.—Karl F. Kellerman, chairman; Edwin W. Allen, and Charles L. Marlatt.

Committee on Manuscripts.

This committee passes upon manuscripts submitted for publication by the department, making recommendations to the Assistant Secretary of Agriculture.

Members.—William A. Taylor, chairman; Milton Whitney, and Jos. A. Arnold.

Approved:

B. T. GALLOWAY,

Assistant Secretary of Agriculture.

AGRICULTURAL COLLEGES AND EXPERIMENT
STATIONS.

KEY TO ABBREVIATIONS.

<i>Acct.</i> , Accountant, Accounts.	<i>Insp.</i> , Inspector, Inspection.
<i>Actg.</i> , Acting.	<i>Insts.</i> , Institutes.
(<i>Actg.</i>), Acting Professor.	<i>Instr.</i> , Instruction, Instructor.
(<i>Adj.</i>), Adjunct Professor.	<i>Invest.</i> , Investigations, Investigational.
<i>Agr.</i> , Agriculture, Agriculturist, Agricultural.	<i>Irrig.</i> , Irrigation, Irrigationist.
<i>Agron.</i> , Agronomy, Agronomist.	<i>Lab.</i> , Laboratory.
<i>Agt.</i> , Agent.	<i>Landsc.</i> , Landscape.
<i>An.</i> , Animal.	<i>Lect.</i> , Lecturer.
<i>Anal.</i> , Analytical, Analysis.	<i>Libr.</i> , Library, Librarian.
<i>Anat.</i> , Anatomy.	<i>Mach.</i> , Machine, Machinery.
<i>Archi.</i> , Architecture.	<i>Mech.</i> , Mechanics, Mechanical.
<i>Assoc.</i> , Associate.	<i>Met.</i> , Meteorology, Meteorologist.
(<i>Assoc.</i>), Associate Professor.	<i>Mfrs.</i> , Manufactures.
<i>Asst.</i> , Assistant.	<i>Mgr.</i> , Manager.
(<i>Asst.</i>), Assistant Professor.	<i>Mgt.</i> , Management.
<i>Bact.</i> , Bacteriology, Bacteriologist.	<i>Mycol.</i> , Mycology, Mycologist.
<i>Biol.</i> , Biology, Biologist, Biological.	<i>Nat.</i> , Natural.
<i>Bot.</i> , Botany, Botanist, Botanical.	<i>Nutr.</i> , Nutrition.
<i>Br.</i> , Branch.	<i>Oler.</i> , Olericulture, Olericulturist.
<i>Brdg.</i> , Breeding.	<i>Org.</i> , Organic.
<i>Chair.</i> , Chairman.	<i>Ornith.</i> , Ornithologist, Ornithology.
<i>Chem.</i> , Chemist, Chemistry, Chemical.	<i>Parasitol.</i> , Parasitologist, Parasitology.
<i>Climat.</i> , Climatology, Climatologist.	<i>Path.</i> , Pathology, Pathologist.
<i>Coll.</i> , College.	<i>Pedag.</i> , Pedagogy, Pedagogics.
<i>Comp.</i> , Comparative.	<i>Pharm.</i> , Pharmacist, Pharmaceutical, Pharmacologist.
<i>Comr.</i> , Commissioner.	<i>Photog.</i> , Photography.
<i>Consult.</i> , Consulting.	<i>Phys.</i> , Physics, Physicist, Physical.
<i>Coop.</i> , Cooperative, Cooperation, Cooperator.	<i>Physiol.</i> , Physiology, Physiologist, Physiological.
<i>Corresp.</i> , Correspondence, Correspondent.	<i>Polit.</i> , Political.
<i>Dem.</i> , Demonstration, Demonstrator.	<i>Pomol.</i> , Pomology, Pomologist.
<i>Dept.</i> , Department.	<i>Pract.</i> , Practice, Practical, Practicums.
<i>Dir.</i> , Director.	<i>Prep.</i> , Preparatory.
<i>Distrib.</i> , Distribution.	<i>Pres.</i> , President.
<i>Div.</i> , Division.	<i>Prim.</i> , Principal.
<i>Dom.</i> , Domestic.	<i>Prod.</i> , Production.
<i>Econ.</i> , Economy, Economic, Economics.	<i>Sch.</i> , School.
<i>Ed.</i> , Education.	<i>Sci.</i> , Science, Scientific.
<i>Ele.</i> , Elementary.	<i>Sec.</i> , Secretary.
<i>Engin.</i> , Engineer, Engineering.	<i>Secon.</i> , Secondary.
<i>Ent.</i> , Entomology, Entomologist.	<i>Sew.</i> , Sewing.
<i>Expt.</i> , Experiment, Experimental, Experimenter.	<i>Sociol.</i> , Sociology.
<i>Ext.</i> , Extension.	<i>Sta.</i> , Station.
(<i>Ext. Asst.</i>), Extension Assistant Professor.	<i>Substa.</i> , Substation.
(<i>Ext. Assoc.</i>), Extension Associate Professor.	<i>Supt.</i> , Superintendent.
<i>Feed.</i> , Feeding.	<i>Surg.</i> , Surgery.
<i>Fert.</i> , Fertility, Fertilizer.	<i>Tech.</i> , Technology, Technical, Technologist.
<i>Flor.</i> , Floriculture, Floriculturist.	<i>Treas.</i> , Treasurer.
<i>For.</i> , Forestry.	<i>Trop.</i> , Tropical.
<i>Gard.</i> , Gardening.	<i>Univ.</i> , University.
<i>Gen.</i> , General.	<i>V. Dir.</i> , Vice Director.
<i>Geol.</i> , Geology, Geologist, Geological.	<i>Veg.</i> , Vegetable, Vegetation.
<i>Grad.</i> , Graduate.	<i>Vet.</i> , Veterinary, Veterinarian.
<i>Hist.</i> , History.	<i>Vit.</i> , Viticulture, Viticulturist.
<i>Hort.</i> , Horticulture, Horticulturist.	<i>V. Pres.</i> , Vice President.
<i>Husb.</i> , Husbandry, Husbandman.	<i>Voc.</i> , Vocational.
<i>Hyg.</i> , Hygiene.	<i>Zool.</i> , Zoology, Zoologist.
<i>Indus.</i> , Industrial, Industry, Industries.	
<i>Inorg.</i> , Inorganic.	

AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.¹

(Prepared in the Office of Experiment Stations,
A. C. TRUE, *Director.*)

ALABAMA.

Alabama Polytechnic Institute and the Agricultural Experiment Station, Auburn.

*College faculty. †Station staff.

*C. C. Thach, A. M., LL. D., *President.*

*†J. F. Duggar, M. S., *Dir. Sta. Agr.* (*†)

*†Samuel Adler, M. S., *Asst. Chem.*

†J. T. Anderson, Ph. D., *Chem., Soil and Crop Invest.*

*P. F. Bahnsen, V. S., *Lect. Phys. Diagnosis.*

*†Thomas Bragg, M. S., (*Asst.*) *Chem.; Asst. Chem.*

*†J. E. Buck, M. S., *Instr. Ent.; Asst. Ent.*

*†J. S. Caldwell, A. M., *Bot.; Plant Physiol.*

*†C. A. Cary, B. S., D. V. M., *Dean Vet. Med. and Surg., Physiol.; Vet. Dir. Farmers' Insts. (State Vet.).*

†E. F. Cauthen, B. S., *Assoc. Agr., Recorder.*

*†L. N. Duncan, M. S., *Agr. Sch. Ext. Work; Supt. Ext. Work (Coop. U. S. D. A.).*

*C. W. Ferguson, D. V. M., M. D. C., *Instr. Vet. Med.*

*†M. J. Funchess, M. S., (*Asst.*) *Agr.; Asst. Agr.*

*†E. S. Girtton, B. S., (*Asst.*) *An. Indus.; Asst. An. Indus.*

*†A. R. Gissendanner, B. S., *Asst. An. Indus.*

*H. M. Hamilton, D. V. M., *Instr. Vet. Med.*

*†C. L. Hare, M. S., *Phys., Physiol. Chem.; Chem.*

†L. J. Hawley, B. S., *Agr. Field Agt.*

*†W. E. Hinds, Ph. D., *Ent.*

*†J. B. Hobdy, M. S., *Agr. Sch. Ext. Work; Asst. in Agr. Ext. Work (Coop. U. S. D. A.).*

†J. B. Jackson, B. S., *Analyst.*

†S. S. Jordan, B. S., *Asst. Beef Husb. (Coop. U. S. D. A.).*

*†I. S. McAdory, B. S., D. V. M., (*Asst.*) *Vet. Sci. Asst. Vet.*

†J. A. McLeod, B. S., (*Columbia*), *Asst. An. Husb.*

*†A. B. Massey, B. S., (*Asst.*) *Bot.; Asst. Bot.*

*P. P. Powell, M. S., (*Asst.*) *Chem.*

*†J. C. C. Price, B. S., *Instr. Hort.; Asst. Hort.*

†Mrs. Birdie I. Robertson, *Asst. Girls' Dem. Work (Coop. U. S. D. A.).*

*†B. B. Ross, M. S., *Dean Agr. Sci.; Agr. Chem.; State Chem.*

*J. R. Rutland, A. B., *Libr.*

*L. A. Scarbrough, B. S., *Asst. Chem.*

†O. H. Sellers, B. S., *Asst. Agr., Sec. to Dir.*

*†J. P. C. Southall, M. A., *Phys.*

†G. V. Stelzenmuller, B. S., *Asst. Field Hort.*

*†G. S. Templeton, B. S., *An. Indus.*

*A. L. Thomas, M. E., *Instr. Phys.*

*†H. B. Tisdale, B. S., *Asst. Agr., Coll. Recorder.*

*†Ernest Walker, B. S., *Hort.*

*W. W. Webb, D. V. M., *Instr. Physiol., Therapeutics.*

*G. R. White, M. D., D. V. S., *Lect. An. Restraint, Surg.*

†J. T. Williamson, B. S., *Agr. Field Agt.*

*†F. A. Wolf, Ph. D., *Plant Path.*

Canebrake Agricultural Experiment Station, Uniontown.

†L. H. Moore, *Dir., Sec.*

Agricultural and Mechanical College for Negroes, Normal.

*College faculty.

*W. S. Buchanan, B. A. S., A. M., *President. Agr.*

*G. C. Buchanan, *An. Indus.*

*Elizabeth B. Cooke, *Millinery, Fancy Sew.*

*Sara E. Grisby, R. N., *Nursing.*

*Willie M. Maddux, *Plain Sew.*

*Louise M. Mason, *Laundrying.*

*C. Olga Mitchell, *Dressmaking.*

*P. C. Parks, B. S. A., *Farm Mgt.*

*Mary W. Stewart, *Cooking.*

*Mrs. Alice M. Watkins, *Supervisor. Female Indus.*

¹ These lists were compiled by Mary A. Agnew and Althea E. Thacker, of the Office of Experiment Stations, and are intended to replace the "Organization Lists of the Agricultural Colleges and Experiment Stations in the United States" heretofore issued by that office. They differ from the latter in that they include only names of persons directly engaged in teaching or investigation in agriculture and home economics.

The names are arranged alphabetically for each institution. This arrangement, with the name index at the end of the bulletin, it is thought, will facilitate the finding of names, especially in the longer lists. An asterisk (*) indicates a college officer and a dagger (†) a station officer. When the title of the position in the station differs from that in the college the latter is given first, except in the case of the director of the station. A key to the abbreviations used is given on page 26.

Agricultural School and Agricultural Experiment Station of the Tuskegee Normal and Industrial Institute, Tuskegee Institute.

*College faculty. †Station staff.

*B. T. Washington, *Principal.*

*†G. W. Carver, M. S., *Dir. Sta. Dept. of Research, Consult. Chem. (*†)*

*†M. F. Ballentine, *Horse Husb.*
 *†J. H. Bias, D. V. S., *Vet.*
 *†G. R. Bridgeforth, B. S., *Dir. Agr. Indus.*
 †M. W. Brooks, *Truck Gard.*
 *Marion Brown, *Ladies' Tailoring.*
 *C. J. Calloway, *Dir. Ext. Div.*
 †T. M. Campbell, *Dem. and Farmers' Inst. Work.*
 *†A. G. Chandler, *Asst. to Farm Supt.*
 *†T. N. Cowen, *Farm Supt.*
 *Mary E. Davis, *Housekeeping.*
 *Minnie E. Davis, *Housekeeping.*
 *Josephine I. Doggett, *Asst. Laundering.*
 *Ophelia M. Donaldson, *Asst. Laundering.*
 *†J. R. Fugett, *Dairying.*
 *Mollie L. Golden, *Housekeeping.*
 *C. A. Graine, *Laundering.*
 *†C. W. Greene, *Farm Crops, Poultry.*
 *Carolyn G. Howard, *Asst. Dom. Sci.*

*Hattie E. King, *Dressmaking.*
 *†Augustus McGriff, *Fruit Growing.*
 *Annie D. Oakes, *Plain Sew.*
 *†R. S. Pompey, *Dairy Husb.*
 *†O. D. Pyles, *Asst. Agr. Instr.; Agr. Chem.*
 *†N. D. Ricks, *Asst. Agr. Instr.; Asst. Farm Supt.*
 *†R. R. Robinson, *Swine Husb.*
 *Susan M. Russell, *Dom. Sci.*
 †W. A. Tate, *U. S. Dem. Work.*
 *Cornelia A. Vivian, *Millinery.*
 *Mrs. B. T. Washington, *Dir. Women's Indus.*
 *†L. J. Watkins, *Road Bldg., Survey, Construction Work.*
 *Luvenia Williams, *Housekeeping.*
 *D. A. Williston, B. S. A., *Landscape Gard.*
 *C. W. Wood, *Libr.*
 *†Matthew Woods, *Asst. to Dirs.*

ALASKA.

Agricultural Experiment Stations, Sitka, Kodiak, Rampart, and Fairbanks.

Under the supervision of A. C. True, Director Office of Experiment Stations, U. S. Department of Agriculture.

†Station staff.

†C. C. Georgeson, M. S., *Special Agt., Sitka.*

†J. P. Anderson, *Hort., Sitka.*
 †G. W. Gasser, B. S., *Asst., Rampart.*
 †C. W. Heideman, jr., *Herdsmen, Kodiak.*

†Laurence Kelly, *Asst. Dairyman, Kodiak.*
 †J. W. Neal, *Asst., Fairbanks.*
 †M. D. Snodgrass, B. S., *Asst., Kodiak.*

ARIZONA.

University of Arizona and the Agricultural Experiment Station, Tucson.

*College faculty. †Station staff.

*A. H. Wilde, Ph. D., *President.*

*†R. H. Forbes, M. S., *Dir. Sta. Dir. Agr. Instr. (*†)*

*P. M. Brinton, M. S., (*Assoc.*) *Chem.*
 *J. G. Brown, *Instr. Biol.*
 †C. N. Catlin, A. M., *Asst. Chem.*
 *†R. W. Clothier, M. S., *Agr.*
 *A. E. Douglass, Sc. D., *Phys.*
 †A. L. Enger, B. S., *Asst. Engin.*
 †G. F. Freeman, B. S., *Plant Brdg.*
 †C. E. Grassick, *Sec.*
 *F. N. Guild, M. S., *Chem.*
 †R. E. Heagy, *Libr.*
 *†W. H. Lawrence, M. S., *Hort.*

†A. M. McOmie, B. S., (*Phoenix*), *Supt. Substa., Asst. Agr. Supt. Farmers' Insts. and Ext. Work.*
 *C. A. Meserve, Ph. D., *Bact.*
 †A. W. Morrill, Ph. D., (*Phoenix*), *Ent. (State Ent.).*
 *†S. F. Morse, B. A. S., *Agr. (Actg.).*
 †G. E. P. Smith, C. E., *Irrig. Engin.*
 *DeRossette Thomas, B. S., *Instr. Home Econ.*
 *†J. J. Thornber, M. A., *Biol.; Bot.*
 *†J. C. Th. Uphof, *Instr. Plant. Brdg.; Asst. Plant Breeder.*
 *†A. E. Vinson, Ph. D., *Agr. Chem.; Biochem.*
 *†F. W. Wilson, M. S., *An. Husb.*

ARKANSAS.

College of Agriculture and the Agricultural Experiment Station of the University of Arkansas, Fayetteville.

*College faculty. †Station staff.

*J. C. Futrall, A. M., *Actg. President University.*

*†Martin Nelson, M. S., *Dean Coll. Agr. Dir. Sta. Supt. Farmers' Insts. Agron. (*†)*

*Mrs. Mary Austin, *Libr.*
 *†G. G. Becker, B. S. A., (*Actg.*) *Ent.; Actg. Ent.*
 *J. M. Borders, B. S. A., *Asst. Ext. Work.*

*†D. H. Branson, B. S., *Asst. Animal Husb.*
 *C. G. Carroll, Ph. D., *Chem.*
 *†R. R. Dinwiddie, V. S., M. D., *Path., Bact.*

¹ On leave.

- *†W. S. Fields, B. S. A., *Instr. Plant Path.*; *Asst. Plant Path.*
- *†W. L. Fowler, B. S. A., *An. and Dairy Husb.*
- *†R. M. Gow, D. V. M., *Vet. Sci.*; *Vet.*
- *†J. L. Hewitt, B. S. A., *Plant Path.*
- *†R. L. Hood, *Libr.*
- *†W. C. Lassetter, B. S., (*Asst.*) *Agron.*; *Asst. Agron.*
- *†C. L. McArthur, M. S., *Instr. Path.*, *Bact.*; *Asst. Path.*, *Bact.*

- *H. E. Morrow, B. S. A., (*Assoc.*) *Chem.*
- *†W. L. Nettleship, *Asst. Dairying.*
- *†L. W. Osborn, B. S. A., *Instr. Agron.*; *Asst. Agron.*
- *†C. V. Ruzek, B. S. (*Asst.*) *Agron.*; *Asst. Agron.*
- *†R. C. Thompson, B. S., *Agr. Chem.*
- *†H. E. Truax, B. S., *Instr. Hort.*; *Asst. Hort.*
- *†J. R. Tucker, B. S., *Instr. Agr. Chem.*; *Asst. Chem.*
- *W. R. Wheelock, B. S. A., *Supt. Ext. Work.*
- *†W. H. Wicks, M. S., *Hort.*

CALIFORNIA.

College of Agriculture and the Agricultural Experiment Station of the University of California, Berkeley.

*College faculty. †Station staff.

*B. I. Wheeler, Ph. D., LL. D., *President of University.*

*†T. F. Hunt, D. Agr., D. Sc., *Dean College of Agr. Dir. Sta. Agr.*(*)†

- *†R. L. Adams, M. S., (*Asst.*) *Agron.*; *Asst. Agron.*
- *J. A. Armstrong, B. S., *Asst. in Agr. Ext.*
- *W. H. Arnold, B. S., (*Davis*), *Instr. Chem.*, *Bot.*
- *†E. B. Babcock, M. S., *Genetics.*
- *†H. S. Baird, B. S., (*Davis*), *Asst. Dairy Indus.*
- *†G. Barovetto, (*Davis*), *Asst. Vit.*
- *†J. T. Barrett, Ph. D., (*Riverside*), *Plant Path.*
- *H. P. Barrows, B. S., *Instr. Agr. Ed.*
- *†S. H. Beckett, B. S., (*Davis*), *Asst. Irrig. (Coop. U. S. D. A.)*
- *†H. E. Billings, M. S., *Asst. Chem.*
- *†F. T. Bioletti, M. S., *Vit.*, *Enology.*
- *†L. O. Bonnet, I. A., *Instr. Vit.*; *Asst. Vit.*
- *†W. W. Bonns, M. S., (*Riverside*), (*Asst.*) *Pomol.*; *Asst. Pomol.*
- *V. C. Bryant, M. S., *Asst. Agr. Ext.*
- *†Mrs. D. L. Bunnell, *Libr.*
- *†J. S. Burd, B. S., *Agr. Chem.*, (*Fert. Control*).
- *†P. S. Burgess, M. S., *Instr. Soil Bact.*; *Asst. Soil Bact.*
- *A. H. Christiansen, B. S., *Asst. Agr. Ext.*
- *Lillian D. Clark, *Asst. Agr. Ext.*
- *W. T. Clarke, B. S., *Agr. Ext.*, *Supt. Farmers' Insts.*
- *J. E. Coit, Ph. D., *Citriculture.*
- *†G. E. Colby,¹ M. S., (*Asst.*) *Agr. Chem.*; *Asst. Chem.*
- *†G. A. Coleman, *Instr. Ent.*; *Asst. Ent.*
- *†I. J. Condit, B. S., *Instr. Citriculture*; *Asst. Citriculturist.*
- *B. H. Crocheron, M. S. A., (*Asst.*) *Agr. Ext. State Leader (Coop. U. S. D. A.)*
- *†W. V. Cruess, B. S., (*Asst.*) *Zymology*; *Asst. Zymologist.*
- *†L. M. Davis, B. S., (*Davis*), (*Asst.*) *Dairy Indus.*; *Asst. Dairy Indus.*
- *†J. D. Denny, (*Davis*), *Asst. Agron.*
- *†W. H. Dore, B. S., *Asst. Agr. Chem.*
- *†J. E. Dougherty, B. S., (*Davis*), (*Asst.*) *Poultry Husb.*; *Asst. Poultry Husb.*
- *†H. H. Douglass, M. S., (*Davis*), *Asst. Dairy Husb.*
- *†B. A. Etcheverry, B. S., *Irrig.*
- *†H. S. Fawcett, M. S., (*Riverside*), (*Assoc.*) *Plant Path.*; *Assoc. Plant Path.*
- *†F. C. H. Flossfeder, (*Davis*), *Instr. Vit.*; *Asst. Vit.*
- *†H. B. Frost, Ph. D., (*Riverside*), *Asst.*, *Citrus Expt. Sta.*

- *†W. F. Gericke, B. S., *Instr. Soil Chem.*; *Asst. Soil Chem.*
- *†J. W. Gilmore, M. S. A., *Agron.*
- *†G. P. Gray, M. S., *Instr. Insecticides*; *Asst. Chem. Insecticide Control.*
- *†J. W. Gregg, B. S., *Landsc. Gard.*, *Flor.*
- *†J. E. Guernsey, M. S., *Asst. Soil Tech.*
- *†E. H. Hagemann, (*Davis*), *Instr. Dairying*; *Asst. Dairy Indus.*
- *†H. M. Hall, Ph. D., (*Asst.*) *Bot.*; *Asst. Bot.*
- *†C. M. Haring, D. V. M., *Vet. Sci.*; *Vet.*, *Bact.*
- *†F. M. Hayes, D. V. M., (*Asst.*) *Vet. Sci.*; *Asst. Vet.*
- *†A. H. Hendrickson, B. S., *Asst. Pomol.*
- *†G. W. Hendry, B. S., *Asst. Agron.*
- *†W. B. Hermes, M. A., (*Asst.*) *Parasitol.*; *Asst. Ent.*
- *†P. L. Hibbard, B. S., *Asst. Agr. Chem.*
- *†E. W. Hilgard, Ph. D., LL. D., *Agr. Chem. Emeritus.*
- *†Miss C. J. Hill, *Asst. Dairy Testing.*
- *†F. E. Hill, (*Santa Monica*), *For.*
- *†D. R. Hoagland, M. S., (*Asst.*) *Agr. Chem.*; *Asst. Agr. Chem.*
- *†W. T. Horne, B. S., (*Asst.*) *Plant Path.*; *Asst. Plant Path.*
- *W. G. Hummel, M. S., (*Asst.*) *Agr. Ed.*
- *T. Fr. Hunt, B. S., *Asst. Agr. Ext.*
- *†O. W. Israelsen, B. S., (*Davis*), *Asst. Irrig.*
- *Mrs. Adele S. Jaffa, M. S., *Lect. Dietetics.*
- *†M. E. Jaffa, M. D., *Nutr.*
- *Katherine D. Jones, B. S., *Asst. Landsc. Gard.*
- *†P. B. Kennedy, Ph. D., (*Asst.*) *Agron.*; *Asst. Agron.*
- *O. J. Kern, (*Asst.*) *Agr. Ed.*
- *James Koeber, (*Davis*), *Instr. Farm Mech.*
- *†E. J. Lea, M. S., (*Asst.*) *Nutr.*; *Asst. Nutr.*
- *†C. B. Lipman, Ph. D., *Soil Chem.*, *Bact.*
- *†W. E. Lloyd, B. S., (*Davis*), *Asst. Poultry Husb.*
- *†R. H. Loughridge, Ph. D., *Agr. Chem.*, *Soil Chem. Emeritus.*
- *†Anna M. Lute, A. B., *Seed Tester (U. S. D. A. Service).*
- *†C. H. McCharles, M. S., (*Asst.*) *Nutr.*; *Asst. Nutr.*
- *†B. A. Madson, B. S. A., (*Davis*), (*Asst.*) *Agron.*; *Asst. Agron.*
- *†L. K. Marshall, (*Fresno*), *Asst. Agron.*
- *†W. C. Matthews, A. B., *Artist.*

¹ On leave.

*†Margaret Mayberry, (Davis), *Libr. Univ. Farm.*
 †W. M. Mertz, (Riverside), *Asst. Pomol.*
 †M. R. Miller, B. S., *Asst. Chem., Insecticide Control.*
 *C. S. Milliken, B. S., (Riverside), *Asst. Supt. Agr. Ext.*
 *†J. F. Mitchell, D. V. M., *Instr. Vet. Sci.; Asst. Vet.*
 †J. N. Moore, (Chico), *For.*
 *†D. N. Morgan, B. S., *Sec. Coll.; Asst. to Dir.*
 *†J. W. Nelson, B. S., (Asst.) *Soil Tech.; Asst. Soil Tech.*
 †L. J. Nickels, B. S., (Davis), *Asst. Ent.*
 †W. F. Oglesby, A. B., *Asst. Vit.*
 †W. E. Packard, M. S., (El Centro), *Asst. Agron. In charge Imperial Valley Substa.*
 †W. G. Perrine, *Supt. Greenhouses, Gardens.*
 *†F. L. Peterson, B. S., (Davis), (Asst.) *Farm Mech.; Asst. Farm Mech.*
 *†B. B. Pratt, B. S., (Asst.) *Pomol.; Asst. Pomol.*
 *†H. J. Quayle, M. S., (Asst.) *Ent.; Asst. Ent.*
 *†C. L. Roadhouse, D. V. M., (Asst.) *Vet. Sci.; Asst. Vet.*
 *†S. S. Rogers, B. S., (Davis), *Instr. Plant Path.; Asst. Plant Path.*
 *†W. A. Setchell, Ph. D., *Bot.*
 †L. T. Sharp, B. S., *Asst. Soil Chem., Bact.*
 *†C. F. Shaw, B. S., *Soil Tech.*
 †Alfred Smith, M. A., *Asst. Soil Tech.*
 †C. O. Smith, M. S., (Whittier), *Asst. Plant Path.*
 †Elizabeth H. Smith, M. S., *Asst. Plant Path.*
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UTAH.

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*College faculty. †Station staff.

*J. A. Widsote, Ph.D., *President*.*†E. D. Ball, Ph.D., *Dir. Sta. Dir. Sch. Agr. Ent., Ext. Div.**†Byron Adler,¹ B. S., (*Asst.*) *Poultry Husb.; Poultryman.**†L. D. Batchelor,¹ Ph.D., *Hort.**S. L. Bingham, *Asst. in Dairying.**C. F. Brown, M. S., *Drainage Engin., Ext. Div.**J. T. Caine, III, M. S. A., *An. Husb. Asst. Dir. Ext. Div.**†C. Y. Cannon, B. S., *Instr. An. Husb.; Asst. An. Husb.**†W. E. Carroll,^{1,2} M. S., *Asst. Dir. Sch. Agr., (Assoc.) An. Husb. An. Husb.**Rhoda B. Cook, (*Asst.*) *Dom. Art.**Blanche Cooper,¹ B. S., *Home Econ.**Alice A. Dunford, B. S., *Instr. Dom. Sci.**†A. D. Egbert, D. V. M., *Foreman Poultry Husb.; Asst. Poultryman.**B. R. Eldredge, *Dairy Agt., Ext. Div. (Coop. U. S. D. A.).*†A. D. Ellison, B. S., *Asst. Agron., Nephi Substa. (Coop. U. S. D. A.).**R. J. Evans, Ph. D., *State Leader Farm Mgt. (Coop. U. S. D. A.). Plant Brgd.**†H. J. Frederick,¹ D. V. M., *Vet. Sci.; Vet.**†J. E. Greaves, Ph. D., *Bact., Physiol. Chem.; Bact.*†Violet Greenhalgh, *Libr.**L. J. Haddock, B. S., *Pubs., Ext. Div.**†F. S. Harris,¹ Ph. D., *Agron. Dir. Sch. Agr. Engin.*†R. A. Hart, M. E., *Drainage Engin. (Coop. U. S. D. A.).**†G. E. Hill, jr.,¹ Ph.D., *Bot.; Plant Path.**†C. T. Hirst, B. S., *Instr. Chem.; Asst. Chem.**J. C. Hogenson, M. S. A., *Agron., Ext. Div. School Coop. Club Work.**Coral Kerr, B. S., *Instr. Dom. Arts.**†J. I. Lauritzen, B. S., *Instr. Bot.; Asst. Plant Path.**J. H. Linford, D. Di., *Corresp. Studies, Ext. Div.**Amy Lyman, B. S., *Instr. Home Econ. County Dem.**Gertrude M. McCheyne, B. S., *Home Econ., Ext. Div.**Elizabeth O. McKay, B. S., *Food, Dietetics.*†W. W. McLaughlin, B. S., *Irrig. Engin. (Coop. U. S. D. A.).*†H. J. Maughan, B. S., *Asst. Agron.**H. J. Pack, B. S., *Instr. Zool.**E. G. Peterson, Ph.D., *Dir. Ext. Div.**William Peterson,¹ B. S., *Geol.**C. W. Porter, A. M., *Dir. Sch. Home Econ. (Assoc.) Chem.**†B. L. Richards, B. S., *Instr. Bot.; Asst. Plant Path.**David Sharp, jr., B. S., *County Dem.**Elizabeth C. Smith, B. L., *Libr.**†L. A. Smith, B. S., *Instr. Bact.; Asst. Bact.**†George Stewart, B. S., *Instr. Agron.; Asst. Agron.**†John Stewart,¹ B. S., (*Asst.*) *Chem.; Assoc. Research Chem.**†Robert Stewart,¹ Ph. D., *Chem.; Asst. Dir., Chem.**R. H. Stewart, B. S., *Instr. Farm Mgt. County Dem. (Coop. U. S. D. A.).*†H. W. Stucki, B. S., *Asst. Agron.**†Howard Sweitzer, B. S., *Instr. Hort.; Asst. Hort.**Mathoniah Thomas, LL.B., *Special Lect. Irrig. Law.**†E. G. Titus,¹ Sc. D., *Zool., Ent.; Ent.**J. P. Welch, B. S., *Instr. Farm Mgt. County Dem. (Coop. U. S. D. A.).**†F. L. West, Ph.D., *Phys.; Met.**R. B. West,¹ C. E., *Agr. Engin.**Robert Wrigley, B. S., *County Dem.*

VERMONT.

College of Agriculture and the Agricultural Experiment Station of the University of Vermont, Burlington.

*College faculty. †Station staff.

*G. P. Benton, D. D., LL. D., *President of University.**†J. L. Hills, Sc. D., *Dean Coll. Agr. Dir. Sta. Agron. (*)*†H. E. Bartram, B. S., *Asst. Plant Path.**†A. A. Borland, M. S., *An. and Dairy Husb.**Thomas Bradlee, B. S. A., *Dir. Ext. Service.**R. T. Burdick, B. S., *Instr. Agron., Farm Mech.**†G. P. Burns, Ph. D., *Bot.**B. A. Chandler, M. F., *Instr. For.**†M. B. Cummings, Ph. D., *Hort.*†G. C. Cunningham, B. S., *Asst. Plant Path., Bact.*†F. C. Fiske, B. S., *Farm Supt.*†W. F. Hammond (Middlebury), *Expert Horse Brgd. (Coop. U. S. D. A.).*†Stanley Hargreaves, *Gardener.*†A. F. Hawes, M. F., *For. (State For.).**F. K. Jackson, M. D., *Physiol.**F. B. Jenks, B. S., *Agr. Ed.*†C. H. Jones, M. S., *Chem.**M. A. Jull, B. S. A., *Lect. Poultry Husb.**C. A. Kern, B. S., (*Asst.*) *Chem.*†W. J. Lamplough, B. S., *Computer.**†E. H. Loveland, M. A., *Asst. Dairy Husb.**†B. F. Lutman, Ph. D., *Plant Path.**Josephine A. Marshall, B. S., *Instr. Home Econ.**N. F. Merrill, Ph. D., *Chem.**A. K. Peitersen, M. A., *Instr. Bot.**H. F. Perkins, Ph. D., *Zool.**†F. A. Rich, V. S., M. D., *Vet. Sci.; Vet.*†Jennie L. Rowell, B. S., *Asst. Chem.**Helen B. Shattuck, A. B., *Libr.*†C. P. Smith, *Treas.*†W. C. Stone, B. S., *Asst. Hort.**Bertha M. Terrill, A. M., *Home Econ.*†C. G. Williamson, B. S., *Asst. Chem.*¹ Engaged also in Extension Work.² On leave.

VIRGINIA.

Virginia Agricultural and Mechanical College and Polytechnic Institute, and the Agricultural Experiment Station, Blacksburg.

*College faculty. †Station staff.

*J. D. Eggleston, A. B., *President.*†S. W. Fletcher,¹ Ph. D., *Dir. Sta.*†B. G. Anderson, B. S., *Supt. Appomattox Sta.*
(*Coop. U. S. D. A.*).†E. T. Batten, B. S., *Asst. Agron.**†W. K. Brainerd, B. S., *Dairy and An. Husb.*
*Dairy Husb.**†Lyman Carrier, M. Agr., *'Agron. Supervisor*
*County Expt. Stas.**W. G. Chrisman, D. V. S., *Vet. Sci.*†R. P. Cocke, *Supt. Williamsburg Sta.*†C. H. Crabill, M. S., *Asst. Plant Path.**R. J. Davidson, A. M., *Agr. Chem.*†D. D. Digges, B. S., *Supt. Charlotte Sta.*†A. W. Drinkard, jr., Ph. D., *Assoc. Hort.*†W. B. Ellett, Ph. D., *Chem.*†W. W. Green, *Supt. Bowling Green and Louisa*
Stas. (Coop. U. S. D. A.).†W. G. Harris, M. S., *Asst. Chem.*†J. C. Hart, B. S., *Supt. Chatham and Axton Stas.*
(*Coop. U. S. D. A.*).†H. H. Hill, M. S., *Asst. Chem.*†A. N. Hodgson, M. S., *Supt. Martinsville Sta.**†E. R. Hodgson, M. S., (*Assoc. Agron.; Assoc.*
*Agron. Supt. Staunton Expt. Farm.**C. W. Holdaway, B. S., (*Assoc. Dairy Husb.*,
*Supt. Creamery.**R. J. Holden, M. S., *Geol.**R. E. Hunt, B. S., (*Assoc. An. Husb.**Elinor I. Jones, *Libr.**J. B. Lucas, B. S., *Asst. Chem.**J. B. McBryde, C. E., *Chem.**J. M. McBryde, Ph. D., Sc. D., *Pres. Emeritus.**†H. L. Price, M. S., *Dean Agr. Dept. Hort.**†H. S. Reed, Ph. D., *Mycol., Bact., Plant*
*Path.**F. L. Robeson, M. E., (*Assoc. Phys.*†W. J. Schoene, M. S., *Ent. (State Ent.).**E. A. Smyth, jr., A. M., LL. D., *Biol.**H. S. Stahl, M. S., *Instr. Biol.**†G. C. Starcher, B. Agr., *Instr. Hort.; Asst.*
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Virginia Truck Experiment Station, Norfolk.

†Station staff.

†T. C. Johnson, A. M., *Dir. Sta. Hort.*†D. E. Fink, M. S. A., *Ent. (Coop. U. S. D. A.).*†F. E. Miller, B. S., *Asst. Hort.*†S. C. Nottingham, B. S., *Asst. in Truck Crops.*†G. R. Parrish, *Treas.*†L. B. Smith, B. S., *Asst. State Ent.*†J. C. Westcott, *Hort. Foreman.*

Hampton Normal and Agricultural Institute, Hampton.

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*H. B. Frissell, D. D., LL. D., *Principal.**C. K. Graham, *Dir. Agr. Dept. and Agr. Ext. Work.**J. D. Aiken, *Mgr. Cope Farm.**W. L. Aiken, *Mgr. Shellbanks Dairy.**Mary A. Bradley, *Asst. Sew.**J. L. B. Buck, *Instr. Farm Phys., Asst. to Agr. Dir.**H. G. Charlton, *Poultryman, Shellbanks Farm.**E. S. Christy, *Instr. Farm Accts.**R. R. Clark, *Instr. An. Husb. Vet.**Amelia A. Cooke, *in charge Home Econ.**R. W. Crouse, *Instr. Hort.**G. J. Davis, *Mgr. Whipple Farm.**Ina H. Fenwick, *Teacher Sew.**Rena M. Fuller, *Teacher Home Econ.**A. G. Gilbert, *Mgr. Shellbanks Farm.**Ada Gilmore, *in charge Laundry.**Mrs. Sarah P. Green, *Instr. Laundry.**Jennie H. Hart, *Teacher Sew.**Lenora E. Herron, *Libr.**Ella L. Hoyt, *Farm Accts., Teacher, Shellbanks*
*Farm.**Peter Kinghorn, *Florist.**R. T. Neal, *Instr. Poultry, Hort.**Caroline D. Pratt, *in charge Dom. Arts.**P. F. Skofield, *Instr. Dairying.**Clara M. Snow, *in charge Shellbanks Farm School.**Mary Stephens, *Instr. Laundering.**John Urquhart, *in charge Horse Barn.**Pearl E. Wales, *Teacher Sew.**Barton White, *Lands. Gard.**Sarah White, *in charge Indus. Sew.**W. T. B. Williams, *Field Agt.*¹ To resign July 1, 1914.

WASHINGTON.

State College of Washington and the Agricultural Experiment Station, Pullman.

*College faculty. †Station staff.

- *E. A. Bryan, A. M., LL. D., *President*.
 *†I. D. Cardiff, Ph. D., *Dir. Sta. Head Bot. Dept. (*)*; *Plant Physiol. (*)*; *Dir. Dept. Dry Land Dem. and Expt. (†)*
- *F. W. Allen, M. S. A., *Instr. Hort.*
 *R. J. Barnett, M. S., (*Assoc.*) *Pomol.*
 *C. Lillian Blanchard, *Instr. Poultry Indus.*
 †H. L. Blanchard, *Dairy, Poultry Invest., Asst. Supt. Substa., Puyallup.*
 *C. M. Brewster, A. M., (*Asst.*) *Inorg. and Phys. Chem.*
 *I. D. Charlton, B. S., (*Asst.*) *Farm Mech.*
 *G. L. Clothier, M. S., *Head For. Dept., For.*
 *R. P. Cope, B. S., (*Asst.*) *Chem.*
 *Agnes H. Craig, B. S., *Head Home Econ. Dept.*
 *H. T. Darlington, M. S., (*Asst.*) *Bot.*
 *P. H. Dirstine, D. V. S., Ph. G., *Instr. Parasitol., Canine Diseases.*
 *W. O. Ellis, M. S., *Instr. Ent.*
 *C. E. Estes, Ch. E., *Chem. Analyst.*
 *W. L. Ferguson, B. S., D. V. S., (*Spokane*), (*Asst.*) *Surg.*
 *†Elton Fulmer, M. A., *Head Chem. Dept., Chem. (State Chem.)*.
 *†E. F. Gaines, B. S., *Instr. Agron.; Actg. Cerealist.*
 †D. C. George, B. S., *Asst. Plant Path.*
 †H. E. Goldsworthy, B. S., (*Lind*), *V. Dir. Dept. Dry Land Dem. and Expt.*
 *†J. G. Hall, M. A., *Plant Path.*
 *O. W. Holmes, B. S., *Instr. Dairy Husb.*
 *†H. F. Holtz, M. S., *Asst. Soil Physicist.*
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 *C. H. Hunt, B. S., *Instr. Chem.*
 *Leila W. Hunt, B. S., *Instr. Home Econ.*
 †Byron Hunter, M. A., *V. Dir. Washington Bureau of Farm Development (Coop. U. S. D. A.)*.
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 *†J. W. Kalkus, D. V. S., (*Asst.*) *Path., Histol.; Asst. Vet.*
 †W. A. Linklater, B. S. A., *Supt. Substa., Puyallup.*
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 †C. K. McWilliams, M. A., *Asst. Chem.*
- *†C. A. Magoon, B. A., (*Assoc.*) *Bot.; Asst. Bact.*
 *Elizabeth Matthews, B. S., (*Asst.*) *Foods, Cookery.*
 *†A. L. Melander,¹ M. S., *Head Zool. Dept., Ent.*
 *Otto Menig, D. V. S., *Anat., Surg.*
 *Clyde Meyers, A. B., *Instr. Ele. Agr.*
 *†C. F. Monroe, B. S. A., (*Asst.*) *An. Husb.; Asst. An. Husb.*
 *†O. M. Morris, B. S., *Head Hort. Dept., Hort.*
 *†S. B. Nelson, D. V. M., *Vet. Sci.; Vet.*
 *†A. B. Nystrom, M. S., *Dairy Husb.*
 †G. A. Olson, M. S., *Chem.*
 *Alice G. Paterson, A. B., (*Asst.*) *Chem.*
 *W. E. Ralston, B. S., D. V. M., *Physiol., Bact.*
 †H. L. Rees, A. B., *Plant Path., Puyallup Substa.*
 †Martha Richmond, *Libr.*
 †E. G. Schafer, M. S., *Agron.*
 *George Severance, B. S., *Head Agr. Dept.*
 *†W. T. Shaw, M. S., *Zool.*
 *Solon Shedd, Ph. D., *Geol.*
 *H. P. Shellabear, M. A., *Instr. Chem.*
 †C. B. Sprague, B. S., *Asst. Hort.*
 †J. L. Stahl, B. A., *Hort., Puyallup Substa.*
 *B. L. Steele, M. A., *Phys.*
 †E. B. Stookey, B. S., *Asst. Agron., Puyallup Substa.*
 *Sadie J. Swenson, *Instr. Textiles.*
 *†C. C. Thom, B. S. A., *Soils; Soil Phys.*
 *C. C. Todd, B. S., *Chem.*
 *J. A. Torney, B. L., *Head Ext. Dept., Supt. Farmers' Insts.*
 *†O. L. Waller, Ph. M., *V. Pres.; Irrig. Engin.*
 *J. E. Weaver, M. A., (*Asst.*) *Bot.*
 *E. E. Wegner, D. V. S., (*Assoc.*) *Vet. Anat., Surg.*
 *V. V. Westgate, M. A., (*Asst.*) *Flor., Gard.*
 *A. S. Wilson, *Libr.*
 †Horace Woolman, *Asst. Plant Path.*
 *†M. A. Yothers, B. S., *Instr. Ent.; Asst. Ent.*
 †W. J. Young, M. S., *Asst. Hort.*

WEST VIRGINIA.

College of Agriculture and the Agricultural Experiment Station of West Virginia University, Morgantown.

*College faculty. †Station staff.

- *T. E. Hodges, D. Sc., *President of University*.
 *†E. D. Sanderson, B. S. A., *Dean Coll. Agr. Dir. Sta.*
- *M. J. Abbey, B. S., *Agr. Ed.*
 *†W. H. Alderman, B. S. A., *Hort.*
 *E. L. Andrews, B. S., (*Asst.*) *Poultry Husb.*
 *L. D. Arnett, Ph. D., *Libr.*
 *T. C. Atkeson, Ph. D., *An. Husb.*
 †Horace Atwood, M. S. A., *Poultryman.*
 *†E. C. Aucter, B. S., *Instr. Hort.; Asst. Hort.*
 *Nellie M. Barnett, B. S., *Ext. Instr. Home Econ.*
 *†P. B. Bennetch, B. S., (*Assoc.*) *Dairy Husb.; Dairy Husb.*
 *†Anthony Berg, B. S., *Instr. Plant Path.; Asst. Plant Path.*
- *†I. S. Cook, Jr., B. S. A., *Agron.*
 *†H. L. Crane,² B. S., *Instr. Hort.; Asst. Hort.*
 *†A. L. Dacy, B. S., (*Assoc.*) *Hort.; Assoc. Hort.*
 *†Henry Dorsey, B. S., *Instr. Agron.; Asst. Agron.*
 †N. J. Giddings, M. S., *Plant Path.*
 *Sadie Guseman, *Asst. Home Econ., Girls' Canning Clubs (Coop. U. S. D. A.)*.
 *†Hubert Hill, M. S., *Asst. Chem.*
 †B. H. Hite, M. S., *V. Dir. Chem.*
 †J. B. Huyett, B. Agr., *Asst. An. Husb. (Coop. U. S. D. A.)*.

¹ On leave.² Assumes duties July 1, 1914.

- *†R. R. Jeffries, B. S., *Instr. Hort.; Asst. Hort.*
 *†O. M. Johnson, B. S., (*Assoc.*) *Farm Mgt.; Farm Mgt. Invest. (Coop. U. S. D. A.).*
 *†W. B. Kemp, B. S., *Instr. Agron.; Asst. Agron.*
 *W. H. Kendrick, A. B., *Asst. Boys' and Girls' Club Work (Coop. U. S. D. A.).*
 *†O. M. Kile, B. S., *Agr. Editor.*
 †L. I. Knight, Ph. D., *Plant Physiol.*
 *F. L. Kortright, D. Sc., *Chem.*
 †J. H. B. Krak, *Asst. Chem.*
 †F. B. Kunst, A. B., *Asst. Chem.*
 *†C. A. Lueder, D. V. S., (*Asst.*) *Vet. Sci.; Vet.*
 *C. E. Myers, B. S., *Instr. Hort.*
 †D. C. Neal, B. S., *Asst. Plant Path.*
 *†B. P. Pattison, B. S., *An. Husb.; Asst. An. Husb.*
 *†L. M. Peairs, M. S., (*Assoc.*) *Ent.; Ent.*
 *A. M. Reese, Ph. D., *Zool.*
 †W. E. Rumsey, B. S. A., *Ent. (State Ent.).*
 *J. L. Sheldon, Ph. D., *Bot., Bact.*
 *†Oliver Smith, B. S., *Instr. Agron.; Asst. Agron.*
 *†R. B. Snapp,¹ B. S., *Instr. An. Husb.; Asst. An. Husb.*
 †E. B. Stephenson, *Treas.*
 †Martha A. Stewart, *Libr.*
 *†L. F. Sutton, B. S. A., *Instr. Hort.; Asst. Hort.*
 *C. R. Titlow, *Dir. Agr. Ext. Work.*
 *C. W. Waggoner, Ph. D., *Phys.*
 †C. E. Weakley, jr., *Asst. Chem.*
 †W. J. White, *Financial Sec.*
 *A. R. Whitehill, Ph. D., *Gen. and Anal. Chem.*

The West Virginia Colored Institute, *Institute.*

*College faculty.

*Byrd Prillerman, A. M., *President.*

*Charlotte R. Campbell, *Cooking.*

*A. W. Curtis, M. Agr., *Dir. Agr. Dept.*

*Mary Eubank, *Supt. Dom. Sci. and Arts.*

*Amanda D. Gamble, *Dressmaking.*

*Mrs. Margaret M. Lowry, *Plain Sew., Millinery.*

*N. A. Murray, B. Agr., *Agr. Chem., Bot.*

WISCONSIN.

College of Agriculture and the Agricultural Experiment Station of the University of Wisconsin, *Madison.*

*College faculty. †Station staff.

*C. R. Van Hise, Ph.D., LL.D., *President of University.*

*†H. L. Russell, Ph.D., *Dean Coll. Agr. Dir. Sta.*

- †C. L. Adams, *Asst. State Feed and Fert. Insp.*
 *B. A. Ahrens, B. S., *Instr. Poultry Husb.*
 *†A. S. Alexander, M. D. C., D. V. M., *Vet. Sci., Horse Brdg.; Vet.*
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 *†S. M. Babcock, Ph. D., LL. D., *Agr. Chem. Emeritus.*
 *†A. C. Baer, B. S., *Instr. Dairy Husb.; Asst. Dairy Husb.*
 *†B. A. Beach, D. V. M. (*Asst.*) *Vet. Sci.; Asst. Vet.*
 *†G. H. Benkendorf, B. S., (*Asst.*) *Dairy Husb.; Asst. Dairy Husb.*
 *Cora E. Binzel, *Instr. Home Econ.*
 *Mary M. Bunnell, B. S., *Instr. Home Econ.*
 *†A. C. Burrill, B. S., *Instr. Econ. Ent.; Asst. Econ. Ent.*
 *†L. J. Cole, Ph. D., (*Assoc.*) *Expt. Brdg.; Expt. Brdg.*
 *†M. H. Crissey, *Asst. in Agr. Econ., Executive Sec.*
 *†Marguerite Davis, B. S., *Asst. Agr. Chem.*
 *†E. J. Delwich, M. S., (*Ashland*), (*Assoc.*) *Agron.; Supt. Branch and Substas.*
 *†M. E. Dickson, B. S., *Instr. Poultry Husb.; Asst. Poultry Husb.*
 *†H. A. Drescher, B. S., *Asst. Agr. Chem.*
 *Clara M. Eckhardt, B. A., *Instr. Home Econ.*
 *†H. M. Elliott, M. A., *Instr. Agr. Econ.; Asst. Agr. Econ. (Coop. U. S. D. A.).*
 *†E. H. Farrington, M. S., *Dairy Husb.*
 *†E. R. Finner, B. S., *Instr. Soils; Asst. Soils.*
 *Anna R. Fleming, *Instr. Home Econ.*
 *†E. B. Fred, Ph. D., (*Asst.*) *Agr. Bact.; Asst. Agr. Bact.*
 *†J. G. Fuller, B. S., (*Assoc.*) *An. Husb.; Assoc. An. Husb.*
 *†C. J. Galpin, M. A., *Instr. Agr. Econ. Country Life Work.*
 *J. J. Garland, B. S., *Asst. Agron.*
 *†J. C. Gilman, B. S., *Asst. Plant Path.*
 *†L. F. Graber, M. S., *Instr. Agron.; Asst. Agron.*
 *Julia R. Grady, *Instr. Home Econ.*
 *†E. J. Graul, B. S., *Instr. Soils; Asst. Soils.*
 *†F. B. Hadley, D. V. M., (*Assoc.*) *Vet. Sci.; Vet.*
 *†J. G. Halpin, B. S., (*Assoc.*) *Poultry Husb.; Poultry Husb.*
 †R. T. Harris, *Asst. Dairy Tests (State Work).*
 *†E. B. Hart, B. S., *Agr. Chem.*
 *†E. G. Hastings, M. S., *Agr. Bact.*
 *†K. L. Hatch, B. S., *Agr. Ed. Sec. Agr. Ext. Work.*
 *†C. S. Hean, B. A., *Libr.*
 *†W. A. Henry, D. Agr., D. Sc., *Agr. Emeritus.*
 *†J. R. Hepler, B. S., *Instr. Hort.; Asst. Hort.*
 *†B. H. Hibbard, Ph. D., *Agr. Econ. (Coop. and Marketing).*
 *†A. W. Hopkins, B. A., *Agr. Journalism. Editor.*
 *†R. F. Howard, B. S., (*Asst.*) *Hort.; Asst. Hort.*
 *†G. C. Humphrey, B. S., *An. Husb.*
 †Heman Isen, B. S., *Asst. Expt. Brdg.*
 †G. R. Ingalls, Ph. B., *Eau Claire Co. Agr. Rep., Eau Claire (Coop. U. S. D. A.).*
 *†A. G. Johnson, M. S., *Instr. Plant Path.; Research Asst. Plant Path.*
 *†James Johnson, M. S., *Instr. Hort.; Asst. Hort.*
 *†E. R. Jones, M. S., (*Assoc.*) *Soils; Assoc. Soil Phys.*
 *†L. R. Jones, Ph.D., D. Sc., *Plant Path.*
 †W. D. Juday, *Oneida Co. Agr. Rep., Rhineland (Coop. U. S. D. A.).*
 †J. C. Jurrjens, B. S., *Asst. Chem (State Feed and Fert. Insp.)*
 *G. W. Keitt, M. S., *Instr. Plant Path.*

¹ Assumes duties July 1, 1914.

- *†F. J. Kelley, B. S., *Asst. Expt. Brdg.*
 *†Frank Kleinheinz, *Instr. An. Husb.; Asst. An. Husb.*
 †A. R. Lamb, B. S., *Asst. Agr. Chem.*
 *†C. E. Lee, M. S., (*Asst.*) *Dairy Husb.; Asst. Dairy Husb.*
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 *†H. E. Lothe, B. S., D. V. M., *Instr. Vet. Sci.; Asst. Vet.*
 *†Henry Lunz, *Instr. Agron.; Asst. Agron.*
 †E. L. Luther, B. S., *State Supervisor of County Reps. (Coop. U. S. D. A.).*
 *†E. V. McCollum, Ph. D., (*Assoc.*) *Agr. Chem.; Agr. Chem.*
 *†E. R. McIntyre, *Instr. Agr. Journalism; Editorial Asst.*
 †O. G. Malde, *Supt. Cranberry Sta., Grand Rapids.*
 *†W. E. Markey, *Asst. An. Husb.*
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U. S. DEPARTMENT OF AGRICULTURE.

DIVISION OF PUBLICATIONS.

ORGANIZATION OF THE DEPARTMENT OF AGRICULTURE, 1913.¹**OFFICE OF THE SECRETARY.****Secretary of Agriculture, DAVID F. HOUSTON.**

The Secretary of Agriculture is charged with the work of promoting agriculture in its broadest sense. He exercises general supervision and control over the affairs of the department and formulates and establishes the general policies to be pursued by its various branches and offices.

Assistant Secretary of Agriculture, BEVERLY T. GALLOWAY.

The Assistant Secretary of Agriculture becomes Acting Secretary in the absence of the Secretary and assists in the general supervision of the work of the department. He is also charged with certain special duties, which include direct supervision of (1) the scientific and technical investigations of the department; (2) miscellaneous clerical and minor changes in the personnel of the department; (3) the publication of results of investigations and experiments; (4) preparation of annual reports and estimates.

Chief Clerk, ROBERT M. REESE.

The Chief Clerk has general supervision of clerks and employees; of the order of business and of the records and correspondence of the Secretary's office; and of expenditures from appropriations for contingent expenses, stationery, etc. He is responsible for the enforcement of the general regulations of the department and is custodian of the buildings.

Office of the Solicitor. FRANCIS G. CAFFEY, Solicitor.

The Solicitor is charged by law (act of May 26, 1910) with the direction of the legal work of the department. Accordingly, he acts as legal adviser to the Secretary and the heads of the several branches of the department, conducts its legal work, and represents it in all legal matters. He approves, in advance of issue, all orders and regulations promulgated by the Secretary under statutory authority.

General office administration; enforcement of the 28-hour law, cattle quarantine laws, and plant quarantine act; miscellaneous legal matters. W. P. JONES, Assistant to the Solicitor, in charge.

This section attends to matters connected with the 28-hour law (act of June 29, 1906), the acts of May 29, 1884, February 2, 1903, and March 3, 1905, relating to the importation, exportation, and interstate transportation of diseased live stock, and the plant quarantine act of August 20, 1912. General administration of the office and miscellaneous legal matters are also assigned to this section.

Law work of the Forest Service. R. W. WILLIAMS, Assistant to the Solicitor, in charge.

The legal work of the Forest Service falls under four headings, as follows:

Claims: Contests arising out of claims to lands in the national forests under homestead, mineral, and other laws.

¹ Gives the names of the principal officials and describes briefly the work of the various branches of the department. Prepared to meet a constant demand for this information. Omits a few offices and committees having to do strictly with the internal workings of the department.—J. A. A.

Trespasses: Cases arising out of timber, fire, fencing, and other trespasses on the national forests.

Opinions: The furnishing of legal opinions to the Forester and review of opinions written by district law officers to be presented to district foresters.

Miscellaneous: Various legal matters connected with the national forests, such as contracts, forms, etc.; reports to the Secretary on proposed action; correspondence with the Attorney General and the Comptroller of the Treasury; and replies to inquiries addressed to the department.

Enforcement of the food and drugs act. P. D. CRONIN, *Assistant to the Solicitor, in charge.*

This section prepares cases arising under section 2 of the food and drugs act, June 30, 1906, for submission to the Attorney General; handles seizures under section 10; prepares cases for trial; and prepares notices of judgment for publication under section 4.

Contract work; enforcement of the meat-inspection law; patents. C. W. BOYLE, *Assistant to the Solicitor, in charge.*

This section draws agreements and leases; prepares cases arising under the meat-inspection law for submission to the Attorney General, including briefs, and prosecutes applications of employees of the department for patents to be dedicated to the public.

Enforcement of the insecticide act. O. H. GATES, *Assistant to the Solicitor, in charge.*

This section prepares cases arising under section 2 of the insecticide act of April 26, 1910, for submission to the Attorney General; handles seizures under section 10; and prepares notices of judgment for publication under section 4. The compiling and revising of the Laws Applicable to the United States Department of Agriculture is intrusted to this section.

Acquisition of lands under the Weeks forestry law. A. H. McCONVILLE, *Assistant to the Solicitor, in charge.*

In connection with the acquisition of lands under the act of March 1, 1911, this section prepares contracts, supervises the work of record examiners, and handles correspondence with the Attorney General.

Assistants to the Solicitor, stationed in the field.

Branches of the Office of the Solicitor located at Missoula, Mont.; Denver, Colo.; Albuquerque, N. Mex.; Ogden, Utah; San Francisco, Cal.; and Portland, Oreg., have each two assistants to the Solicitor, except at Ogden, where there is one. These men are legal advisers to the district foresters and handle the legal work of the Forest Service in the field, besides such local legal work of the department as may be assigned by the Solicitor.

Assistants in the field.—W. C. Henderson, G. E. Trowbridge, D. F. McGowan, R. E. Feagans, H. P. Dechant, W. F. Staley, H. H. Clarke, J. F. Lawson, J. O. Seth, Maury Curtis, and E. C. Arnold.

Office of Information. G. W. WHARTON, *Chief.*

The Office of Information is established to secure the widest possible circulation for the discoveries and recommendations of the scientists, specialists, and field workers of the department. It gives out to the public press facts taken from publications, and also from oral statements of specialists. Material so disseminated is set forth in such form as to attract attention and lead to the adoption of the methods recommended. A Weekly News Letter to Crop Correspondents is published, and also each month during the crop season an agricultural forecast outlining the crop prospects.

Office of Markets. CHARLES J. BRAND, *in charge.*

The Office of Markets is making a special study of market conditions, methods of grading, standardizing, packing and shipping, and the nature of the commercial transactions by means of which farm produce gets from the farm to the consumer.

Rural Organization Service. T. N. CARVER, *Director*

The Rural Organization Service is designed to promote business organizations among farmers, not only in the field of marketing, but also in that of finance, insurance, cooperative buying, and cooperative production. As preliminary work a careful study is being made in the field to find out what forms

of organization have been tried, under what conditions they have succeeded, and under what they have failed. This information is to be available for the use of farmers who desire to organize themselves into business associations.

The Division of Rural Finance, under Mr. C. W. Thompson, is making a survey of credit facilities and credit needs of farmers in different sections of the country.

The Division of Producers' and Purchasers' Associations, under Mr. L. H. Goddard, is making a similar survey in this field.

Appointment Clerk, R. W. ROBERTS.

The Appointment Clerk prepares all papers connected with appointments, transfers, promotions, reductions, details, furloughs, and removals and has charge of correspondence with the Civil Service Commission. He is the custodian of oaths of office, personal reports, and efficiency reports. He has the custody and use of the department seal.

Office of Exhibits. F. LAMSON-SCRIBNER, *Special Agent on Exhibits.*

The Office of Exhibits handles the correspondence of the department relative to exhibits at fairs and expositions of various kinds; cooperates with the several branches of the department in preparing exposition material; ships, installs, and cares for such exhibits; and investigates methods of displaying them.

WEATHER BUREAU.

Chief, CHARLES F. MARVIN; Assistant Chief, HENRY E. WILLIAMS; Chief Clerk and Executive Assistant, C. C. CLARK.

The Weather Bureau has charge of the forecasting of the weather; the issue and display of weather forecasts and storm, cold-wave, frost, and flood warnings; the gauging and reporting of river stages; the maintenance and operation of the United States Weather Bureau telegraph and telephone lines; the collection and transmission of marine intelligence for the benefit of commerce and navigation; the reporting of temperature and rainfall conditions for agricultural interests; and the taking of such meteorological observations as may be necessary to determine and record the climatic conditions of the United States.

Division of Observations and Reports. ALFRED J. HENRY, *in charge.*

The duties of this division include the subdivisions of the forecast and marine meteorological service.

Forecast Section.—This section receives and charts, twice daily, telegraphic reports of the prevailing weather conditions and issues a statement of impending weather changes in all parts of the country. In the case of severe disturbances warnings are issued to special storm-warning stations along the Lakes and the seacoast.

Marine Section.—This section collates from reports of marine observers all meteorological and physical information pertaining to the oceans and is charged with the supervision of the radiotelegraph weather service of the Atlantic and Pacific coasts.

River and Flood Division. ALFRED J. HENRY, *in charge.*

This division gives information as to stages of water along the navigable rivers and issues flood warnings. It gathers information on the depth of snow-fall in the mountains of the West, for a study of the flow of water in the streams supplying irrigation projects, and on the rate of evaporation from ponds and lakes, in the interest of water storage for irrigation, power development, and navigation. It supervises, on the part of the Weather Bureau, the experiment stations maintained jointly by the Weather Bureau and the Forest Service.

Climatological Division. P. C. DAY, *in charge.*

This division supervises about 4,000 cooperative stations and about 300 special stations maintained in connection with the corn, wheat, cotton, sugar, and rice industries. From these are collected the records of daily observations of temperature, precipitation, and other meteorological conditions necessary to establish a history of the climate of the various portions of the United States.

This division collects and publishes weekly during the winter months data showing the depth of snow on the ground and the thickness of ice in rivers and harbors. It has charge also of the barometry of the United States and of the preparation of the normals of pressure, temperature, vapor pressure, precipitation, etc. The official in charge of this division is the editor of the Monthly Weather Review.

Instrument Division. DELOS T. MARING, *Chief*.

This division equips stations with the instruments used in the making of meteorological observations, equips the storm-warning stations with steel towers for the display of flags and electric and oil-burning lanterns, and installs automatic and recording river gauges.

Telegraph Division. THEODORE T. MOORE, *Chief*.

This division receives and transmits all telegrams, arranges and controls telegraph circuits, maintains and repairs United States Weather Bureau telegraph and telephone lines and submarine cables, and examines all telegraph accounts.

Library. CHARLES F. TALMAN, *in charge*.

The library includes standard works of reference and technical books on meteorology and allied sciences and a complete file of the publications of meteorological and climatological services in all parts of the world. A catalogue is prepared of the meteorological contents of all the principal scientific periodicals of the world, including proceedings and transactions of societies. Translations from foreign languages are made in the library.

Printing Division. ROBERT SEYBOTH, *Chief*.

This division prints and mails the daily weather map and the various charts and miscellaneous printed matter pertaining to the bureau and has the custody of and distributes station forms.

Division of Supplies. BENJAMIN A. BLUNDON, *Chief*.

This division purchases and issues supplies and is charged with the safe-keeping of all property belonging to the bureau.

Accounts Division. EDGAR B. CALVERT, *Chief*.

This division audits, adjusts, and prepares for payment all accounts and claims against the bureau; prepares advertisements; issues requests for passenger transportation; prepares the annual estimates of appropriations; transacts all business relating to the financial interests of the bureau; and supervises the construction of Weather Bureau buildings outside of Washington, including repairs thereto.

Mount Weather Meteorological Research Observatory, Mount Weather, Va. WILLIAM R. BLAIR, *in charge*.

The observatory carries on an extensive system of observations and experiments along the line of meteorological research. The work includes the exploration of the atmosphere to altitudes of 3 to 10 miles by means of kites and balloons; research in the allied subjects of solar radiation and atmospheric electricity; and the discussion of meteorological observations from the point of view of their relation to solar physics and weather forecasting. The results of these observations and experiments are described in the Bulletin of the Mount Weather Observatory.

Weather Bureau stations and work outside of Washington, D. C.

This bureau maintains throughout the United States, in the West Indies, and in Hawaii about 200 meteorological stations employing from 1 to 10 men each.

For forecast purposes the United States is divided into districts comprising: (1) The upper Mississippi Valley and the Northwest, Henry J. Cox, Chicago, Ill., in charge. (2) Louisiana, Texas, Arkansas, and Oklahoma, Isaac M. Cline, New Orleans, La., in charge. (3) Utah, Colorado, New Mexico, and Arizona, Frederick H. Brandenburg, Denver, Colo., in charge. (4) California and Nevada, George H. Willson, San Francisco, Cal., in charge. (5) Washington, Oregon, and Idaho, Edward A. Beals, Portland, Oreg., in charge. (6) The remainder of the United States, forecaster on duty, Washington, D. C., in charge. At the first three of the stations named morning forecasts only are prepared and distributed, at the last three both morning and evening forecasts.

For the collection and distribution of climatological data the United States, including Porto Rico and Hawaii, is divided into 44 local sections, which, with the names of the officials in charge and the section centers, are as follows:

Alabama: Patrick H. Smyth, Montgomery.	Nebraska: George A. Loveland, Lincoln.
Arizona: Robert R. Briggs, Phoenix.	Nevada: Harvey S. Cole, Reno.
Arkansas: Henry F. Alciatore, Little Rock.	New England: John W. Smith, Boston, Mass.
California: George H. Willson, San Francisco.	New Jersey: G. Harold Noyes, Trenton.
Colorado: Frederick H. Brandenburg, Denver.	New Mexico: Charles E. Linney, Santa Fe.
Florida: Alexander J. Mitchell, Jacksonville.	New York: Wilford M. Wilson, Ithaca.
Georgia: Charles F. von Herrmann, Atlanta.	North Carolina: Lee A. Denson, Raleigh.
Hawaii: William B. Stockman, Honolulu.	North Dakota: Orris W. Roberts, Bismarck.
Idaho: Edward L. Wells, Boise.	Ohio: J. Warren Smith, Columbus.
Illinois: Clarence J. Root, Springfield.	Oklahoma: J. Pemberton Slaughter, Oklahoma.
Indiana: Verne H. Church, Indianapolis.	Oregon: Edward A. Beals, Portland.
Iowa: George M. Chappel, Des Moines.	Pennsylvania: George S. Bliss, Philadelphia.
Kansas: Thorp B. Jennings, Topeka.	Porto Rico: F. Eugene Hartwell, San Juan.
Kentucky: Ferdinand J. Walz, Louisville.	South Carolina: Richard H. Sullivan, Columbia.
Louisiana: Isaac M. Cline, New Orleans.	South Dakota: Samuel W. Glenn, Huron.
Maryland and Delaware: Oliver L. Fassig, Baltimore, Md.	Tennessee: Roscoe Nunn, Nashville.
Michigan: Charles F. Schneider, Grand Rapids.	Texas: Bernard Bunnemeyer, Houston.
Minnesota: Ulysses G. Purssell, Minneapolis.	Utah: Alfred H. Thiessen, Salt Lake City.
Mississippi: William E. Barron, Vicksburg.	Virginia: Edward A. Evans, Richmond.
Missouri: George Reeder, Columbia.	Washington: George N. Salisbury, Seattle.
Montana: R. Frank Young, Helena.	West Virginia: Henry C. Howe, Parkersburg.
	Wisconsin: Henry B. Hersey, Milwaukee.
	Wyoming: Robert Q. Grant, Cheyenne.

BUREAU OF ANIMAL INDUSTRY.

Chief, A. D. MELVIN; *Assistant Chief*, A. M. FARRINGTON; *Chief Clerk*, CHARLES C. CARROLL.

The Bureau of Animal Industry has charge of the work of the department relating to the live-stock industry. In general it deals with the investigation, control, and eradication of diseases of animals, the inspection and quarantine of live stock, the inspection of meat and meat food products, and with animal husbandry and dairying.

Animal Husbandry Division. GEORGE M. ROMMEL, *Chief*.

This division studies the breeding and feeding of farm animals and poultry, and passes upon the pure breeding of animals imported into the United States for breeding purposes. The division is engaged in work in cooperation with the War Department in encouraging the breeding of horses for military purposes. It studies also the cost of production of poultry and eggs, methods of improving the quality of farm eggs, and market and transportation problems connected with the egg and poultry trade.

Staff.—G. Arthur Bell, senior animal husbandman in certification of pedigrees; Harry M. Lamon, senior animal husbandman in poultry investigations; W. F. Ward, senior animal husbandman in beef cattle investigations; H. H. Reese, animal husbandman in charge of central horse-breeding district, Front Royal, Va.; W. F. Hammond, animal husbandman in charge of Morgan horse farm and New England horse-breeding district; John O. Williams, animal husbandman in charge of Colorado horse-breeding station; Ralph J. Carr, senior animal husbandman in animal nutrition and swine investigations; and E. L. Shaw, senior animal husbandman in charge of work of this division at the experiment farm, Beltsville, Md.

Biochemic Division. M. DORSET, *Chief*.

This division prepares tuberculin and mallein for free distribution to health officers for use in official tests; conducts experiments with the object of obtaining vaccines and antitoxins for animal diseases; carries on researches concerning the causes of certain infectious diseases; conducts field demonstrations of methods for controlling hog cholera, and takes part in the control of viruses, serums, toxins, and analogous products intended for use in the treatment of domestic animals. In connection with the meat-inspection service, it makes bacteriological and chemical examination of meats and meat food products and of condiments, etc., used in their preparation; carries on experiments with dips and disinfectants; and assists in enforcing the insecticide act of 1910 by examining articles intended for use in combating insects and fungi which infest domestic animals.

Scientific staff.—J. A. Emery, assistant chief and member of the Insecticide and Fungicide Board; C. N. McBryde, in charge of bacteriological investigations of meats; R. M. Chapin, in charge of investigations of dips and disinfectants; W. B. Niles, supervising field inspector; U. G. Houck, O. B. Hess, B. W. Murphy, inspectors in charge of hog-cholera-eradication experiments; T. M. Price, in charge of central meat-inspection laboratory; A. H. Roop, C. H. Swanger, W. B. Smith, A. E. Graham, E. A. Boyer, C. N. Marsh, laboratory inspectors in charge of branch meat-inspection laboratories.

Dairy Division. B. H. RAWL, *Chief*.

This division collects and disseminates information concerning dairy farming, the care and improvement of dairy cattle, and the production, care, and distribution of dairy products. It is charged also with the details of administration of the laws concerning the inspection of factories and markets for "renovated" or "process" butter.

Assistants in charge of sections.—L. A. Rogers, dairy products investigations; Helmer Rabild, dairy farming investigations; S. C. Thompson, dairy manufacturing investigations; Ernest Kelly, market milk investigations; J. E. Dorman, western dairy investigations; Robert McAdam, renovated-butter inspection.

Field Inspection Service. R. A. RAMSAY, *Chief*.

This division inspects live stock at points of origin, in transit, and at market centers, disinfects cars, and enforces other measures to prevent the spread of contagious diseases through the channels of interstate commerce. It is charged also with the details of administering the 28-hour law.

Meat Inspection Division. R. P. STEDDOM, *Chief*.

The work of the Meat Inspection Division includes the ante-mortem and the post-mortem inspection of cattle, sheep, swine, and goats slaughtered at establishments engaged in interstate or foreign commerce; the supervision of such establishments and of the various processes of preparing, curing, canning, packing, etc., so as to insure sanitary conditions, equipment, and methods; the condemnation and proper disposal of carcasses and products found to be diseased, unwholesome, or otherwise unfit for human food; the marking and certification of meats and products that have been inspected and passed, and the regulation and supervision of the interstate transportation and exportation of meats and meat food products.

Pathological Division. JOHN R. MOHLER, *Chief*.

This division conducts scientific investigations of animal diseases; carries on experiments with immunizing agents for the purpose of protecting animals against diseases; cooperates with the State agricultural experiment stations with a view to combating diseases peculiar to the localities; determines pathological specimens referred to the division for diagnosis; and prepares and distributes black-leg vaccine.

Scientific staff.—Henry J. Washburn, senior bacteriologist; J. S. Buckley, in charge of field investigations; Adolph Eichhorn, in charge of glanders investigations; B. A. Gallagher, in charge of investigations concerning diseases of poultry and cold-blooded animals; Charles F. Flocken, in charge of cooperative experiments with the Minnesota Experiment Station; Robert J. Formad, assistant in animal pathology; Jacob Traum, assistant in animal bacteriology; John M. Buck, assistant in bacteriology; George M. Potter, in charge of black-leg investigations; H. C. Campbell, in charge of experiments in cooperation with the Pennsylvania Live-stock Sanitary Board; Charles F. Dawson, experiments in cooperation with the Florida State Board of Health; L. Enos Day, in charge of branch pathological laboratory at Chicago, Ill.; George Byron Morse, in charge of branch pathological laboratory at South Omaha, Nebr.

Quarantine Division. RICHARD W. HICKMAN, *Chief*.

The inspection and quarantine of imported animals with a view to excluding contagion, the management of the animal quarantine stations, and the inspection of live stock for export come under this division. The ships carrying exported animals are also inspected, and regulations as to fittings, equipment, ventilation, feed, water, attendants, etc., are enforced. The Quarantine Division administers the sanitary regulations governing the importation of hides, hay, and straw, and directs the tuberculin testing of cattle and the mallein testing of horses for export and import. It also carries on work in cooperation with State and other authorities for the intrastate tuberculin testing of dairy and

breeding cattle and of cows supplying milk to cities, with a view to eliminating tuberculosis from dairy herds and from among such breeding cattle.

Staff.—George W. Pope, assistant chief, and B. T. Woodward, in charge of tuberculin testing of dairy cattle.

Zoological Division. B. H. RANSOM, *Chief*.

This division investigates diseases of parasitic origin, collects and describes animal parasites of all kinds, determines such parasites as are sent to the bureau for identification, and keeps a card index of animal parasites and a bibliography of literature relating to them.

Scientific staff.—Albert Hassall, H. W. Graybill, Maurice C. Hall, and Howard Crawley, assistant zoologists; W. D. Foster, junior zoologist; Cooper Curtice, assistant in field investigations.

Experiment Station. E. C. SCHROEDER, *Superintendent*; W. E. COTTON, *Assistant*.

The Experiment Station of the bureau is located at Bethesda, Md. It conducts investigations of animal diseases with a view to their control and eradication and their bearing on the public health. A small farm is maintained in such a manner as to provide the other divisions of the bureau with facilities for making observations for which large domestic animals are needed. The work of the station consists of both independent original investigations and investigations in cooperation with and supplemental to those of the other divisions.

Editorial Office. JAMES M. PICKENS, *Editor*.

This office edits manuscripts prepared in the bureau, reads proof, indexes such publications as require it, prepares special articles and other material for publication, makes translations, compiles information, and attends to correspondence relating to the publications and to miscellaneous subjects.

FOREST SERVICE.

Forester, HENRY S. GRAVES; *Associate Forester*, ALBERT F. POTTER.

The Forest Service administers the national forests, studies forest conditions and methods of forest utilization, investigates the mechanical and physical properties of woods and the processes employed in the manufacture of forest products, and gathers information concerning the needs of the various wood-using industries and the relation of forests to the public welfare generally.

The work of the Forest Service is organized under the Office of the Forester, 5 branches, 6 districts, and 163 national forests.

OFFICE OF THE FORESTER.

Office of the Editor. HERBERT A. SMITH, *Editor*; FINDLEY BURNS, *in charge of technical review*; BRISTOW ADAMS, *in charge of information*; DON CARLOS ELLIS, *in charge of educational cooperation*; C. M. BALLARD, *in charge of proofs and forms*.

This office disseminates information concerning forestry through the public press and other channels and performs the editorial and educational work of the service, including the review and proof reading of publications and forms, cooperation with teachers, officers of public instruction, and others, the preparation, installation, and care of forest exhibits, and the care and use of the lantern-slide collection.

Accounts. M. E. FAGAN, *Chief*; E. A. MELZAR, *Assistant Chief*.

This office is in charge of all fiscal affairs pertaining to the Forest Service—general bookkeeping, controlling accounts, allotments, and liabilities, and all operations of district fiscal agents.

BRANCH OF OPERATION.

JAMES B. ADAMS, *Assistant Forester in charge*; D. D. BRONSON, *General Inspector*; G. G. ANDERSON, *Administrative Assistant*.

This branch has general supervision of the personnel, quarters, equipment, supplies, and of all permanent improvement work on the national forests.

Geography. C. A. KOLB, *Acting Chief.*

This office collects and preserves maps, compiles general maps and folios for the Forest Atlas, supervises the engraving and printing of maps and diagrams, tabulates forest statistics, collects and records data showing the status of lands within the national forests, and performs photographic work for the service.

Maintenance. GEORGE A. BENTLEY, *Chief.*

The work of this office includes all matters relating to the care of quarters and the custody of supplies, furniture, instruments, and other equipment in Washington, D. C.

BRANCH OF LANDS.

JAMES B. ADAMS, *Assistant Forester in charge*; F. W. REED, *Forest Inspector.*

This branch has general supervision of all matters relating to the application of the public-land laws to the lands within the national forests, and the uses of national forest lands other than timber sales and grazing.

Land Classification. F. W. REED, *in charge.*

Examination and classification of lands within the national forests to determine their value for forest purposes.

Settlement.—F. L. Harvey, *in charge.* Administration of the Forest Homestead Act of June 11, 1906.

Classification.—H. E. Woolley, *in charge.* Revision of forest boundaries and general classification of lands within national forests as to their value for forest purposes.

Claims and Occupancy. CHARLES H. SQUIRE, *in charge.*

The work of this office includes all matters relating to claims on the national forests prior to proceedings before registers and receivers on hearings ordered. The office cooperates with the Office of the Solicitor in procuring necessary evidence to sustain the department's contests; it is also concerned with all questions relating to the occupancy of national forest land for purposes other than timber sales or grazing.

Water Power. O. C. MERRILL, *Chief Engineer*; T. W. NORCROSS, *Assistant Chief Engineer.*

The work of this office includes the handling of all routine connected with the occupancy and use of forest land for hydro-electric power purposes, and of all reports to the Department of the Interior upon rights of way granted by the Secretary of the Interior upon such lands. It also has charge of road-construction work under the provisions of the act of August 10, 1912, appropriating 10 per cent of the annual gross revenue of the national forests for road construction.

BRANCH OF SILVICULTURE.

W. B. GREELEY, *Assistant Forester in charge*; EARLE H. CLAPP and R. Y. STUART, *Forest Inspectors.*

Through the district foresters the Branch of Silviculture has supervision of timber sales, timber and fire trespass, and reforestation on the national forests, and of working plans for their better administration. It conducts forest investigations and cooperates with the States and private owners in fire protection and the practice of forestry.

State Cooperation. J. G. PETERS, *Chief.*

This office, in cooperation with the States, investigates forest conditions and suggests needed legislation and forest policies; prepares digests of State forest laws; cooperates with a number of States, under the Weeks law (act of Mar. 1, 1911), in the protection of the watersheds of navigable streams; directs expenditures for this purpose; and inspects the work done in the field.

Forest Investigations. RAPHAEL ZON, *Chief*; S. T. DANA, *Assistant Chief.*

The Office of Forest Investigations deals mainly with the scientific problems underlying the practical management of national and private forests. It directs the work at the national forest experiment stations and investigates the factors controlling the distribution of forests and forest trees, the relation of

forests to stream flow and climate, the conditions under which natural regeneration of cut-over, burned-over, or otherwise denuded areas takes place, and the species and methods adapted to use in artificial reforestation under varying site conditions. It also studies the requirements of important species as to climate, soil, moisture, and light. The office furnishes information to owners regarding the care of their woodlands, gives advice as to the best species to plant, and studies the distinguishing characteristics of native and exotic tree species and their woods. The library of the Forest Service is connected with this office; it contains 12,200 books and pamphlets on forestry and allied subjects and 29,641 photographs of trees and forest conditions.

BRANCH OF GRAZING.

ALBERT F. POTTER, *Associate Forester, in charge*; LEON F. KNEIPP, *Assistant forester*; WILL C. BARNES, *Inspector of Grazing*.

The Branch of Grazing has, through the district foresters, general supervision of the range in the national forests. When the number of stock to be allowed on each national forest has been determined by the Secretary of Agriculture, the Branch of Grazing establishes the year-long grazing fee to be charged for each class of stock and authorizes the grazing of sheep and goats upon those portions of the forests which in the judgment of the forester may properly be opened to them. It also conducts investigations concerning the best use of the forage resources of the national forests.

BRANCH OF PRODUCTS.

W. B. GREELEY, *in charge*.

Laboratory. HOWARD F. WEISS, *Director*.

A forest-products laboratory is maintained in cooperation with the University of Wisconsin, at Madison. The laboratory conducts the following classes of experimental investigations in the utilization of forest products: (1) The investigation of problems in experimental research; (2) experimental work in cooperation with commercial operations to verify laboratory experiments on a commercial scale; (3) cooperation with individuals or companies to assist them in applying principles and processes of proved commercial value. The lines of work pursued include wood preservation, wood chemistry, timber tests, technology, and maintenance.

Industrial Investigations. O. T. SWAN, *in charge*.

This office studies the wood-using industries of various States, woods used in manufacture, and methods of disposing of mill waste; collects statistics on the price of lumber at the mill and at the principal distributing markets of the country; and studies specifications and grading rules. The office also secures statistics of importance to the experimental work of the service and studies the movements of lumber to and from the principal markets.

ACQUISITION OF LANDS UNDER THE WEEKS LAW.

WM. L. HALL, *Assistant Forester in charge*; K. W. WOODWARD, *in charge of administration of acquired lands*; W. W. ASHE, *in charge of examination of lands*; R. W. DIEFFENBACH, *in charge of survey of lands*.

This office designates the areas where lands are to be purchased, receives proposals, examines lands, conducts tentative negotiations, and prepares recommendations to the Secretary of Agriculture and the National Forest Reservation Commission on lands to be acquired under the act of March 1, 1911, for the protection of the watersheds of navigable streams.

DISTRICTS.

District 1.—National forests in northern Idaho, Montana, North Dakota, and the northwest corner of South Dakota; headquarters at Missoula, Mont. F. A. Silcox, district forester; E. W. Kramer, district engineer.

District 2.—National forests in Colorado, Kansas, Nebraska, the greater part of South Dakota, eastern and central Wyoming, Minnesota, and Michigan; headquarters at Denver, Colo. Smith Riley, district forester; E. Leonard Lundgren, district engineer.

District 3.—National forests in most of Arizona and all of New Mexico, Oklahoma, Arkansas, and Florida; headquarters at Albuquerque, N. Mex. A. C. Ringland, district forester; E. Leonard Lundgren, district engineer.

District 4.—National forests in Utah, northwestern Arizona, most of Nevada, southern Idaho, and western Wyoming; headquarters at Ogden, Utah. E. A. Sherman, district forester; J. P. Martin, district engineer.

District 5.—National forests in California and western Nevada; headquarters at San Francisco, Cal. Coert Du Bois, acting district forester; F. H. Fowler, district engineer.

District 6.—National forests in Washington, Oregon, northwestern California, and Alaska; headquarters at Portland, Oreg. George H. Cecil, district forester; P. H. Dater, district engineer.

Within each district the Offices of Operation, Silviculture, Grazing, Products, and Lands perform duties similar to those performed by the corresponding branches outside the districts. The assistant district foresters in charge of these offices in the several districts are as follows:

Operation.—(1) J. F. Preston; (2) Fred W. Morrell; (3) A. O. Waha and A. S. Peck; (4) A. C. McCain; (5) Roy Headley; (6) C. H. Flory.

Silviculture.—(1) D. T. Mason; (2) C. M. Granger; (3) J. C. Kircher; (4) Ovid M. Butler; (5) T. D. Woodbury; (6) F. E. Ames and C. S. Judd.

Grazing.—(1) C. H. Adams; (2) J. W. Nelson; (3) John Kerr; (4) Homer E. Fenn; (5) John H. Hatton; (6) T. P. McKenzie.

Products.—(5) C. S. Smith; (6) H. B. Oakleaf.

Lands.—(1) R. H. Rutledge; (2) C. J. Stahl; (3) Frank C. W. Pooler; (4) T. C. Hoyt; (5) L. A. Barrett; (6) C. J. Buck.

BUREAU OF PLANT INDUSTRY.

Physiologist and Pathologist and Chief of Bureau, WILLIAM A. TAYLOR;
Horticulturist and Assistant Chief of Bureau, LEE CLEVELAND CORBETT;
Chief Clerk, JAMES E. JONES; *Officer in charge of publications,* J. E. ROCKWELL; *Officer in charge of records,* W. P. Cox.

The Bureau of Plant Industry studies plant life in all its relations to agriculture. The scientific work of the bureau is divided into 29 distinct groups, over each of which is placed a scientifically trained officer, who reports directly to the chief and assistant chief of the bureau. The work of the bureau is conducted on the project plan, the investigations under each of the offices being arranged by group projects consisting of closely related lines of work, which group projects are further divided into projects.

Laboratory of Plant Pathology. ERWIN F. SMITH, *Pathologist in charge.*

This is the central working laboratory for all of the pathological investigations conducted by the bureau. Studies of the diseases of a wide variety of crop plants are made in the laboratory and supplemented by field investigations and experimentation.

Scientific staff.—R. E. B. McKenney, pathologist; Florence Hedges, Nellie A. Brown, and Lucia McCulloch, assistant pathologists; Mary K. Bryan and Ella M. Enlows, scientific assistants.

Pathological Collections and Inspection Work. FLORA W. PATTERSON, *Mycologist in charge.*

This office maintains economic collections of pathological and related material; identifies edible and poisonous fungi; studies problems in entomogenous fungi; conducts taxonomic work in cooperation with various offices of the bureau; and makes miscellaneous identifications. In addition to securing new species of pathological fungi and systematically inserting them where they may be readily available for study, card indexes are maintained which refer to descriptions of fungi or relate to mycological or pathological subjects. According to the regulations of the Federal Horticultural Board systematic inspections are made of all plants received or distributed by the offices of Foreign Seed and Plant Introduction, Crop Physiology and Breeding Investigations, Gardens and Grounds, and Congressional Seed Distribution, in order to prevent the introduction or dissemination of plant diseases.

Scientific staff.—Vera K. Charles, assistant mycologist; Anna L. Jenkins, scientific assistant.

Fruit-Disease Investigations. MERTON B. WAITE, *Pathologist in charge.*

These studies deal with diseases of fruits and fruit trees and methods of controlling or preventing them. They cover deciduous orchard fruits, citrus fruits, small fruits, and the cultivated nuts. Field demonstrations are an important part of the work.

Scientific staff.—C. L. Shear, Charles Brooks, J. G. Grossenbacher, W. S. Ballard, and J. W. Roberts, pathologists; S. M. McMurren, assistant pathologist; Clara H. Hasse, George W. Keitt, Durward F. Fisher, Angie M. Beckwith, and Raymond B. Wilcox, scientific assistants; J. M. Shull, botanical artist; and Leslie Pierce, assistant in spraying demonstrations and experiments.

Investigations in Forest Pathology. HAVEN METCALF, *Pathologist in charge.*

This office studies various diseases affecting forest trees and timber, as well as ornamental and shade trees. The work is conducted in close cooperation with the Forest Service.

Scientific staff.—George G. Hedgcock, pathologist; E. P. Meinecke, J. Franklin Collins, James R. Weir, William H. Long, Rolla Kent Beattie, and Neil E. Stevens, forest pathologists; Carl P. Hartley, assistant pathologist; Adeline Ames and Theodore C. Merrill, assistant forest pathologists; C. J. Humphrey, forest assistant; Della E. Ingram, Ruby J. Tiller, John S. Boyce, Ruth M. Bates, and Nicholas R. Hunt, scientific assistants; Caroline Rumbold and Frederick D. Heald, experts.

Cotton and Truck Disease and Sugar-Plant Investigations. W. A. ORTON, *Pathologist in charge.*

These investigations cover diseases of garden vegetables, including field demonstration of methods of control and prevention; diseases of cotton and of cowpeas and other forage crops; the culture and utilization of sugar beets, including diseases, improvement in yield and quality of the crop, extension of sugar-beet culture, and the improvement of methods of growing and handling the crop; and the culture and diseases of sugar cane, sugar maple, sorghum, and other sugar-producing plants.

Scientific staff.—H. A. Edson, F. J. Pritchard, and J. B. Norton, physiologists; C. O. Townsend, I. E. Melhus, W. W. Gilbert, H. W. Wollenweber, and L. L. Harter, pathologists; P. A. Yoder, sugar-cane technologist; C. F. Clark, assistant agronomist; W. B. Clark, assistant chemist; H. B. Shaw, assistant pathologist; Venus W. Pool, Clara O. Jamieson, Ethel C. Field, O. A. Pratt, C. W. Carpenter, and M. B. McKay, scientific assistants; E. C. Rittue, assistant.

Crop Physiology and Breeding Investigations. WALTER T. SWINGLE, *Physiologist in charge.*

This office investigates the physiology of crop plants with a view to determining the limiting factors which control their successful culture and the breeding and testing of new varieties. Several field stations are maintained. Field investigations are conducted on some of the Indian reservations of the Southwest for testing crop plants which seem likely to be suited for culture by the Indians and by white settlers in adjoining regions. Dates, Smyrna figs, hardy citrus fruits, pistaches, and certain drought-resistant tree crops are being tested.

Scientific staff.—S. C. Mason, arboriculturist; G. P. Rixford, physiologist; Maude Kellerman, botanical assistant; E. M. Savage, assistant plant breeder; Bruce Drummond and E. W. Hudson, assistants.

Soil Bacteriology Investigations. KARL F. KELLERMAN, *Physiologist in charge.*

This work is a study of the relation of bacteria to soil fertility, plant growth, cellulose destruction, and the fixation of nitrogen. Pure cultures of nodule-forming bacteria for leguminous crops are distributed.

Scientific staff.—Ira G. McBeth, physiologist; F. M. Scales, assistant soil mycologist; R. C. Wright, F. L. Goll, and Lewis T. Leonard, scientific assistants.

Acclimatization and Adaptation of Crop Plants; Cotton Breeding. O. F. COOK, *Bionomist in charge.*

These investigations have special reference to the acclimatization in the South and Southwest of Central American varieties of cotton, corn, and other tropical crop plants. The breeding of cottons for the boll-weevil territory is a special feature.

Scientific staff.—G. N. Collins and H. Pittier, botanists; J. H. Kinsler, agriculturist; D. A. Saunders, plant breeder; A. T. Anders, assistant in cotton breeding; C. B. Doyle and R. M. Meade, scientific assistants; G. B. Gilbert, J. H.

Kempton, C. G. Marshall, Guy S. Meloy, and Walton G. Wells, assistants in crop acclimatization.

Drug-Plant, Poisonous-Plant, Physiological, and Fermentation Investigations. RODNEY H. TRUE and W. W. STOCKBERGER, *Physiologists in charge.*

This branch of the bureau studies the commercial culture of drug-producing crops and tea; stock-poisoning plants and methods of preventing the losses caused by them; and plant physiology and fermentation.

Scientific staff.—A. B. Clawson, Heinrich Hasselbring, W. Van Fleet, C. Dwight Marsh, physiologists; H. H. Bartlett, Otis F. Black, H. H. Bunzel, Frank Rabak, and A. F. Sievers, chemical biologists; S. L. Jodidi, organic chemist; W. W. Eggleston, assistant botanist; Lon A. Hawkins, S. C. Hood, James Thompson, and T. B. Young, scientific assistants; G. Archie Russell, expert.

Grain Standardization. J. W. T. DUVEL, *Technologist in charge.*

These investigations relate to the harvesting of grain and its proper preparation for market; its handling, storing, and grading on the farm, at country elevators, and in the terminal markets; and its handling by transportation companies. The purpose is to fix definite standards for the grading of grain, so as to encourage the use of improved methods of handling. This work is conducted at Washington, D. C., and at branch laboratories located at Baltimore, Md.; Chicago, Ill.; Decatur, Ill.; Fargo, N. Dak.; Kansas City, Mo.; and New Orleans, La.

Scientific staff.—E. G. Boerner, G. H. Baston, H. J. Besley, W. P. Carroll, C. L. Cannon, J. H. Cox, L. M. Jeffers, R. C. Miller, E. L. Morris, Philip Rothrock, G. A. Russell, L. M. Thomas, and F. B. Wise, assistants.

Agricultural Technology, Cotton Standardization, Fiber and Paper Plant Investigations. N. A. COBB, *Technologist in charge.*

These investigations deal with the improvement of technological methods in crop production; the standardization and grading of cotton, measurement of staple, technological ginning investigations, and testing the waste, tensile strength, and bleaching qualities of the different grades of cotton as standardized by the Government; the testing of plants believed to be suitable for paper manufacture; the investigation of fiber plants likely to prove of value in the United States; and the encouragement of fiber-plant industries.

Scientific staff.—L. H. Dewey, botanist in charge of fiber-plant investigations; W. E. Chambers, technologist; Albert Mann, plant morphologist; D. E. Earle and Fred Taylor, cotton technologists; William S. Dean, William R. Meadows, and George E. Carr, assistants in agricultural technology; Emil G. Arzberger, pathologist; Jason L. Merrill, assistant chemist; Frank C. Miles and Robert L. Nixon, scientific assistants; John F. Barghausen, mechanical assistant.

Biophysical Investigations. LYMAN J. BRIGGS, *Biophysicist in charge.*

This office studies physical problems connected with the work of the Bureau of Plant Industry. Attention is chiefly directed at present to biophysical problems in dry-land agriculture, the water requirements and nutrition of crop plants, the influence of the physical environment on crop growth, and investigations in electroculture.

Scientific staff.—J. O. Belz, assistant; J. W. McLane and Julia R. Pearce, laboratory assistants; A. B. Campbell, mechanical assistant.

Seed-Testing Laboratories. EDGAR BROWN, *Botanist in charge.*

These laboratories examine samples of commercial seeds for the presence of adulteration, and conduct a general propaganda in the interest of pure seed for the farmer. The work is performed both in Washington, D. C., and at cooperative laboratories in the field.

Scientific staff.—F. H. Hillman, assistant botanist; W. L. Goss, George T. Harrington, Emma F. Sirrine, Lovina S. Merick, Bertha C. Hite, Anna M. Lute, Norma Waddle, Flora G. Ernst, Helen M. Henry, Etta O. Gilbert, scientific assistants; Mary L. Stott, Cora Jacobs, Emma S. Doyle, laboratory aids.

Cereal Investigations. MARK ALFRED CARLETON, *Cerealists in charge.*

This work deals with the culture, adaptation, improvement, and uses of cereal crops, the prevention of diseases affecting cereals, and the cultivation and breeding of flax for seed purposes, including a study of flax diseases.

Scientific staff.—Carleton R. Ball, C. E. Chambliss, H. V. Harlan, C. E. Leighty, and C. W. Warburton, agronomists; E. L. Adams, C. H. Clark, F. A.

Kiene, jr., and P. V. Cardon, assistant agronomists; H. B. Humphrey, pathologist; A. A. Potter, assistant pathologist; Cecil Salmon, physiologist; John F. Ross and D. E. Stephens, farm superintendents; L. C. Aicher, Manley Champlin, John H. Parker, J. A. Clark, N. C. Donaldson, J. Mitchell Jenkins, E. M. Johnston, Jenkin W. Jones, J. D. Morrison, B. E. Rothgeb, T. R. Stanton, Louis Wermelskirchen, and F. R. Babcock, scientific assistants; G. A. McMurdo, assistant; L. R. Breithaupt, L. C. Burnett, W. T. Craig, and A. D. Ellison, agents.

Corn Investigations. C. P. HARTLEY, *Physiologist in charge.*

These investigations cover the principal factors that influence the quantity, quality, and profitableness of acre production of corn. They are conducted throughout the United States on farms of members of corn-improvement clubs and other interested farmers.

Scientific staff.—Ernest B. Brown, Curtis H. Kyle, and L. L. Zook, physiologists; J. G. Willier and Fred D. Richey, scientific assistants.

Tobacco and Plant Nutrition Investigations. W. W. GARNER, *Physiologist in charge.*

The tobacco work has to do with the improvement of tobacco by hybridization and selection, the improvement of methods of growing and handling the crop, the combating of diseases, and the general study of the tobacco-growing industry. Experiments and demonstrations in the growing of tobacco in rotation with farm crops are features of the work.

The plant-nutrition studies relate to some of the broad problems concerned in the growth and development of crop plants as affected by nutrition.

Scientific staff.—E. H. Mathewson and G. W. Harris, crop technologists; Otto Olson, E. G. Beinhart, D. E. Brown, W. M. Lunn, E. G. Moss, R. H. Milton, B. F. Scherffius, and James P. Young, assistants in tobacco investigations; J. E. Blohm, special agent; J. S. Cunningham, expert; Charles W. Bacon and H. A. Allard, assistant physiologists; Charles L. Foubert, scientific assistant; Charles S. Ridgeway, assistant in botanical laboratory work.

Forage Crop Investigations. CHARLES V. PIPER, *Agrostologist in charge.*

The Forage Crop Investigations include methods of production; development and dissemination of new valuable varieties; extension of forage crops into sections where they are adapted but are grown only to a limited extent; and cooperation in the introduction and extension of new crops.

Scientific staff.—J. M. Westgate and H. N. Vinall, agronomists; Roland McKee, assistant agrostologist; M. W. Evans, W. J. Morse, A. B. Cron, Samuel Garver, R. W. Edwards, and Robert E. Getty, scientific assistants.

Alkali and Drought Resistant Plant Breeding Investigations. T. H. KEARNEY, *Physiologist in charge.*

This office investigates the alkali resistance of crop plants; develops by breeding and selection, strains of field crops which will be more resistant to drought than the varieties now obtainable; and studies the physiology of drought resistance. The work is conducted in close cooperation with other branches of the bureau concerned with the upbuilding of agriculture in the West and Southwest.

Scientific staff.—H. L. Shantz and A. C. Dillman, physiologists; R. L. Piemeisel, scientific assistant.

Economic and Systematic Botany. FREDERICK V. COVILLE, *Botanist in charge.*

This office maintains economic collections of cultivated plants and makes systematic studies of grasses and other economic plants, compiles information on native plants for publication, tests wild and little-known plants, and experiments with a view to the improvement of the grazing areas on the national forests.

Scientific staff.—A. S. Hitchcock, systematic agrostologist; W. E. Safford, assistant curator; P. L. Ricker and A. H. Moore, assistant botanists; Agnes Chase and Ivar Tidestrom, scientific assistants; Alice Henkel, assistant.

Farm Management Investigations. W. J. SPILLMAN, *Agriculturist in charge.*

This office studies the details of farm practice. Its main object is to improve farm practice by introducing better business methods and by applying the principles of science wherever they are known. The types of farming prevailing in the various sections of the country are being studied in a number of localities, and a detailed study of farm economics and business principles is

being made. Studies of range management and of the use of the cactus as a forage plant are also a part of the work.

Scientific staff.—J. H. Arnold, O. H. Benson, G. A. Billings, D. A. Brodie, Levi Chubbuck, L. A. Clinton, R. W. Clothier, J. S. Cotton, H. R. Cox, M. A. Crosby, L. G. Dodge, J. A. Drake, D. W. Frear, C. L. Goodrich, David Griffiths, Byron Hunter, J. M. Johnson, W. A. Lloyd, J. C. McDowell, A. D. McNair, H. A. Miller, A. G. Smith, C. B. Smith, Harry Thompson, E. H. Thomson, E. O. Wooton, and D. W. Working, agriculturists; O. E. Baker, C. M. Bennett, G. W. Bush, J. S. Cates, L. G. Connor, D. H. Doane, L. W. Fluharty, H. W. Gilbertson, C. M. Hennis, C. E. Hoke, R. C. Hoopingarner, H. B. McClure, G. E. Monroe, H. H. Mowry, C. P. Reed, A. B. Ross, F. D. Stevens, S. M. Tracy, R. E. Willard, assistant agriculturists; E. A. Boeger, H. R. Cates, Jay Coryell, H. M. Dixon, John L. Fidler, W. C. Funk, Earl S. Haskell, H. N. Humphrey, O. A. Juve, Clyde McKee, M. B. Oates, F. E. Robertson, A. K. Rothenberger, L. W. Kephart, J. L. Sherman, E. A. Stanford, Earl D. Strait, H. A. Turner, H. F. Williams, A. P. Yerkes, and J. F. Zimmer, scientific assistants; J. S. Ball, Lillian Church, M. O. Cooper, M. R. Cooper, W. R. Humphries, G. H. Miller, H. B. Munger, O. S. Rayner, H. G. Strait, and Raymond S. Washburn, assistants in farm cost accounting; W. A. Etherton, farm architect; Ilena M. Bailey, expert; T. R. Bryant, G. I. Christie, D. H. Doane, R. J. Evans, K. L. Hatch, E. K. Hibshman, A. N. Hume, Wm. D. Hurd, C. D. Jarvis, E. C. Johnson, O. M. Johnson, Eben Mumford, C. J. Oviatt, C. W. Pugsley, L. S. Tenny, A. D. Wilson, Hiram T. French, Charles E. Thorne, Thos. P. Cooper, and R. B. Coglon, State leaders.

Farmers' Cooperative Demonstration Work. BRADFORD KNAPP, *Special Agent in charge.*

This work is a system of practical instruction for farmers on their own farms by which better farm practices along all lines are illustrated through demonstrations, carried out under the instruction of a corps of State, district, and county agents. The work is mainly in cooperation with States, colleges of agriculture, county organizations, and others. In cotton territory this work specially shows farmers how to raise cotton under boll-weevil conditions, to diversify, etc. Boys' and girls' demonstration work is also conducted on farms.

States.—Texas, Oklahoma, Louisiana, Arkansas, Tennessee, Mississippi, Alabama, Georgia, Florida, South Carolina, North Carolina, Virginia, Maryland, West Virginia, and Kentucky.

Scientific staff.—J. A. Evans, O. B. Martin, agriculturists and general assistants; W. B. Mercier, H. E. Savely, E. Gentry, I. W. Hill, agriculturists and general field agents; Jesse M. Jones, assistant. W. F. Proctor, W. D. Bentley, C. W. Watson, Mason Snowden, R. S. Wilson, B. L. Moss, J. Phil Campbell, W. W. Long, C. R. Hudson, T. O. Sandy, William L. Watson, H. D. Tate, August Stabler, Dr. Fred Mutchler, State agents.

Dry-Land Agriculture Investigations. E. C. CHILCOTT, *Agriculturist in charge.*

This office studies proper cultural methods for the growing of crops in the semiarid regions of the West, especially in that portion known as the Great Plains area. The objects are to determine the best methods of soil preparation and crop rotation for the conservation of moisture and the maintenance of humus in the soil.

Scientific staff.—J. S. Cole, W. W. Burr, traveling field assistants; W. A. Peterson, J. M. Stephens, O. J. Grace, W. D. Griggs, F. L. Kelso, and J. E. Muddell, farm superintendents; C. B. Brown, C. A. Burmeister, E. F. Chilcott, A. L. Hallsted, J. H. Jacobson, L. N. Jensen, J. G. Lill, O. R. Mathews, H. C. McKinstry, G. W. Morgan, A. J. Ogaard, W. M. Osborn, M. Pfaender, J. T. Sarvis, H. G. Smith, R. S. Towle, J. C. Thysell, and Leroy D. Willey, assistants.

Western Irrigation Agriculture. C. S. SCOFIELD, *Agriculturist in charge.*

This work is concerned with the development of profitable agriculture on the lands to be placed under irrigation in the western United States, and also with the testing of various crops suited for growth under irrigation. The work is conducted in cooperation with a number of the investigational offices of the bureau.

Scientific staff.—F. D. Farrell, agronomist; F. B. Headley, assistant agriculturist; Beyer Aune, R. E. Blair, Dan Hansen, S. H. Hastings, and Fritz Knorr, farm superintendents; Argyle McLachlan, W. E. Townsend, J. A.

Holden, C. R. Letteer, C. E. Peterson, assistants; Lester A. Richardson, scientific assistant.

Horticultural and Pomological Investigations. A. V. STUBENRAUCH, *Pomologist and Horticulturist in charge.*

These investigations are concerned with the improvement of methods of growing, handling, shipping, sorting, and marketing perishable fruits and truck and related crops; landscape and vegetable gardening; floriculture; and related subjects. The work is subdivided into fruit-marketing investigations; fruit-transportation and storage investigations; fruit-district investigations; viticultural investigations; nut-culture investigations; pomological breeding investigations, including the improvement of fruits by bud selection; miscellaneous investigations bearing on the development of the fruit industry; truck-crop investigations; landscape-gardening, floriculture, and miscellaneous horticultural investigations; potato investigations; fruit-history investigations; fruit-nomenclature investigations; and fruit-identification investigations.

Scientific staff.—G. B. Brackett, H. P. Gould, George C. Husmann, A. W. McKay, H. J. Ramsey, C. P. Close, and E. R. Lake, pomologists; A. D. Shamel, physiologist; S. J. Dennis, refrigeration technologist; William Stuart and D. N. Shoemaker, horticulturists; W. F. Wight, botanist; W. W. Tracy, sr., superintendent of testing gardens; F. L. Mulford, landscape gardener; H. C. Thompson, W. V. Shear, and H. M. Conolly, assistant horticulturists; C. W. Mann, C. A. Reed, and C. S. Pomeroy, assistant pomologists; C. G. Patten, expert; Richard Schmidt, assistant in viticultural investigations; William E. Mosher, assistant in refrigeration; George M. Darrow, Charles Dearing, George W. Dewey, W. F. Fletcher, K. B. Lewis, Leo B. Scott, D. D. Ward, Margaret Connor, P. M. Lombard, Herbert C. Gore, Edward L. Markell, scientific assistants; F. L. Husmann, viticultural superintendent.

Experimental Gardens and Grounds. E. M. BYRNES, *Assistant in charge.*

This office is charged with the care and ornamentation of the department grounds, the maintenance of greenhouses and plant collections, and the propagation of plants for experimental and other purposes. Experimental work with florists' crops is also being conducted in the greenhouses.

Congressional Seed Distribution.

This work consists of the securing, packeting, and mailing of the quantities of vegetable, flower, and other seeds and plants necessary for congressional distribution, as well as the testing, propagation, and distribution of improved seeds of various crops.

Staff.—R. A. Oakley, agronomist in immediate charge; Oliver F. Jones, executive clerk; J. E. W. Tracy, assistant superintendent of testing gardens.

Foreign Seed and Plant Introduction. DAVID FAIRCHILD, *Agricultural Explorer in charge.*

This office secures promising new seeds and plants, both by agricultural exploration and by correspondence, and these are tested at the plant-introduction gardens or through cooperation with other offices, experiment stations, experimenters, and private individuals. Investigations in plant propagation and in the development of certain plant industries are features of the work.

Scientific staff.—P. H. Dorsett, plant introducer, in charge of plant-introduction field stations; Peter Bisset, plant introducer, in charge of foreign plant distribution; Frank N. Meyer and F. Wilson Popenoe, agricultural explorers; George W. Oliver, plant breeder and propagator; H. C. Skeels and R. A. Young, scientific assistants; Stephen C. Stuntz, botanical assistant; Robert L. Beagles, assistant farm superintendent, in charge of plant-introduction field station, Chico, Cal.; Edward Simmonds, garden and field station superintendent, in charge of subtropical plant introduction field station, Miami, Fla.; H. E. Juenemann, in charge of bulb-testing garden, Bellingham, Wash.; John M. Rankin, assistant farm superintendent, in charge of Yarrow plant-introduction field station, Rockville, Md.; W. H. F. Gomme, assistant farm superintendent, in charge of plant-introduction field station, Brooksville, Fla.; J. H. Allison, expert.

Arlington Experimental Farm. Directed by Assistant Chief of Bureau.

The Arlington farm is the field laboratory at Washington for the Bureau of Plant Industry, as well as for other bureaus of the department. Widely varying field tests are conducted on the farm.

Staff.—E. C. Butterfield, assistant horticulturist in general charge; J. C. Criswell, assistant superintendent.

BUREAU OF CHEMISTRY.

Chief, CARL L. ALSBERG; *Assistant Chief*, ———; *Supervising Clerk*, F. B. LINTON; *Editor*, G. O. SAVAGE; *Librarian*, A. E. DRAPER.

The Bureau of Chemistry is concerned primarily with questions of agricultural chemistry of public interest, analytical work and investigations under the food and drugs act, and other chemical investigations referred to it by the Government.

Enforcement of the food and drugs act.

The Food Inspection Division, the Division of Drugs, the Miscellaneous Division, and the Dairy Laboratory are concerned in the enforcement of the food and drugs act. In addition, 20 food and drug inspection laboratories at various points devote their time entirely to such work and report directly to the chief of the bureau. These branch laboratories are located at the following points: Boston, A. L. Sullivan, chief; Buffalo, W. L. Dubois, chief; Chicago, A. L. Winton, chief; Cincinnati, B. R. Hart, chief; Denver, R. S. Hiltner, chief; Honolulu, Hawaii, A. W. Hansen, chief; Kansas City, Mo., F. W. Liepsner, chief; Nashville, R. W. Balcom, chief; New Orleans, W. J. McGee, chief; New York, R. E. Doolittle, chief; Omaha, S. H. Ross, chief; Philadelphia, C. S. Brinton, chief; Pittsburgh, M. C. Albrech, chief; Portland, Oreg., A. L. Knisely, chief; St. Louis, D. B. Bisbee, chief; St. Paul, F. G. Smith, acting chief; San Francisco, H. M. Loomis, chief; San Juan, P. R., A. E. Taylor, acting chief; Savannah, W. C. Burnet, chief; Seattle, R. W. Hiltz, chief.

Office of Chief Inspector.

There is a corps of 43 food and drug inspectors, under a Chief Inspector, W. G. Campbell. The taking of samples for analysis constitutes their chief duty, though special investigations in collaboration with the chemists are also made and factories where food and drugs are prepared are inspected.

Food Inspection Division. L. M. TOLMAN, *Chief*.

The Food Inspection Division has charge of the inspection of food products (not including cattle foods or dairy products) under the food and drugs act. This work includes the distribution and analysis of samples (including check analyses of samples sent in from branch laboratories), preparation of cases, and supervision over the correspondence relating to cases and to general questions arising under the food and drugs act as they relate to these products. Many special studies of the manufacture and production of food products are made with the object of developing experts qualified to testify in cases arising under the food and drugs act. Special studies are also made of analytical methods for the examination of foods, partly in collaboration with the Association of Official Agricultural Chemists. Examinations of samples are made for other departments of the Government service as requested.

Scientific staff.—E. M. Chace, chief of food technology laboratory and assistant chief of division; H. S. Bailey, chief of oil, fats, and wax laboratory; A. R. Albright, M. Boyle, C. L. Black, L. B. Burnett, A. M. Doyle, C. O. Dodge, P. B. Dunbar, E. H. Goodnow, H. C. Gore, W. E. Hillyer, C. W. Harrison, B. G. Hartmann, M. J. Ingle, R. C. Kent, L. C. Mitchell, H. E. Patten, J. I. Palmore, J. G. Riley, H. R. Smith, W. C. Taber, E. L. P. Treuthardt, B. B. Wilcox, and C. P. Wilson, assistants.

Division of Drugs. L. F. KEBLER, *Chief*.

This division studies the properties, composition, and quality of drugs and medicinal preparations, and analyzes samples of such products taken in the enforcement of the food and drugs act. It also studies methods which may lead to more satisfactory analytical processes, especially for testing potent plant drugs and products derived from them.

Scientific staff.—G. W. Hoover, chief of drug inspection laboratory; W. O. Emery, chief of synthetic products laboratory; E. K. Nelson, chief of essential-oils laboratory; H. E. Buchbinder, V. K. Chesnut, C. D. Ewing, E. H. Grant, E. C. Merrill, F. P. Morgan, A. G. Murray, S. Palkin, C. E. Parker, B. H. St. John, and C. D. Wright, assistants.

Miscellaneous Division. J. K. HAYWOOD, *Chief*.

This division studies waters, cattle foods, forage crops, grains, insecticides and fungicides, trade wastes, and certain hygienic problems, makes analyses under

the food and drugs act and the insecticide act, and performs such miscellaneous chemical work as may be referred to it. In collaboration with the Bureau of Plant Industry, studies are being made of the changes in composition of grains due to storage and shipping; the composition of range forage plants of the West; and the efficiency of certain insecticides and their effect upon foliage. In collaboration with several experiment stations, studies of more complete methods of analysis of insecticides are being made.

Scientific staff.—Water laboratory: W. W. Skinner, chief; F. W. Baughman, W. D. Collins, F. B. Furber, J. B. Reed, and J. W. Sale, assistants. Cattle-food and grain laboratory: G. L. Bidwell, chief; C. E. Goodrich, P. H. Waldruff, H. L. Walter, and G. P. Walton, assistants. Insecticide and fungicide laboratory: C. C. McDonnell, chief; A. K. Balls, F. L. Elliott, J. J. T. Graham, E. L. Griffin, O. D. Knight, W. J. Morgan, E. J. Nealon, W. B. Pope, R. C. Roark, C. M. Smith, C. H. Walker, and H. A. Whitman, assistants. Trade-wastes laboratory: Under chief of division; W. D. Lynch, assistant.

Division of Carbohydrate Investigations. C. S. HUDSON, Chief.

The sugar inspection laboratory analyzes sugars, sirups, molasses, honey, jellies, jams, preserves, infant foods, confectionery, and similar substances in connection with the enforcement of the food and drugs act. In cooperation with the contracts laboratory, dextrins, glucose, starches, and other carbohydrate materials used by the Bureau of Engraving and Printing, as well as all samples of sugars, starches, sirups, and molasses bought by the General Supply Committee, are examined. The division investigates the manufacturing processes used in the production of raw and refined sugar and molasses, maple sugar, sirups from cane, maple, and sorghum, and confectionery and jellies. Improved methods of chemical analysis are studied, and also, in collaboration with the International Commission for Uniform Methods of Sugar Analysis, the characteristic constants by which pure carbohydrates are distinguished.

Scientific staff.—A. H. Bryan, chief of sugar inspection laboratory; C. G. Church, J. K. Dale, T. S. Harding, G. J. Hough, H. S. Paine, S. F. Sherwood, and M. N. Straughn, assistants.

Animal Physiological Chemistry Laboratory. F. C. WEBER, Chief.

The work in this laboratory includes metabolism and feeding experiments with foods, organic and inorganic compounds, and various carbohydrates; a complete study of infant foods and of the application of chemical methods to the determination of deterioration of animal foods; collaborative work on the production and composition of gelatin and glue; and experimental work to improve the methods of analysis ordinarily employed in physiological chemistry.

Scientific staff.—L. H. Almy, F. C. Cook, and H. W. Houghton, assistants.

Bacteriological Laboratory. —, Chief.

This laboratory makes bacteriological examinations of food materials, both fresh and cold stored, and inspects methods of handling and preparation. The germicidal, antiseptic, and preservative value of certain drugs, chemicals, and fruit juices is tested, bacteria, yeasts, and molds are identified and classified, and surgical dressings, gauzes, ligatures, etc., are examined to determine their sterility.

Scientific staff.—C. Bates, R. C. Greathouse, E. Le Fevre, and M. L. Mason, assistants.

Contracts Laboratory. P. H. WALKER, Chief.

The Contracts Laboratory examines materials purchased by the United States Department of Agriculture to determine their purity and compliance with specifications, and does similar work for the other executive departments in Washington. Specifications for supplies are prepared and criticized. Paints and paint materials are studied in cooperation with the Bureau of Standards and the American Society for Testing Materials. Other special investigations deal with enamel-ware cooking utensils, rubber goods, postmark canceling inks, writing inks, typewriter ribbons, glue, soap, lubricating oils, and other supplies used by the Government.

Scientific staff.—C. B. Bacon, E. W. Boughton, J. H. Bower, E. F. Deysher, L. Feldstein, S. Ginsburg, H. C. McNeil, G. C. Schmidt, F. W. Smither, and J. B. Wilson, assistants.

Dairy Laboratory. G. E. PATRICK, *Chief*.

The Dairy Laboratory examines dairy products of every description and studies methods for making such examinations. A large part of the work at present is the examination of interstate samples of milk, butter, cheese, condensed milks, dried milks, malted milks, lactated foods, ice cream, and all other dairy products to determine questions as to their adulteration and misbranding under the food and drugs act. Samples of imported dairy products are examined, and also samples of dairy products submitted by the General Supply Committee of the Government. Samples from other sources are analyzed when such work promises to be of public benefit.

Scientific staff.—C. H. Biesterfeld, B. D. Johnson, J. T. Keister, and C. C. Scheffler.

Enological Laboratory. WILLIAM B. ALWOOD, *in charge*.

This laboratory studies (1) alcoholic ferments and the malorganisms associated with them in fruit musts, ciders, wines, and fruit by-products and (2) the composition of fruits and fruit juices, their fermented products, and the residue which is left in the marc or pomace. The assistant in the work is J. O. Carrero.

Food Research Laboratory. M. E. PENNINGTON, *Chief*.

The Food Research Laboratory makes chemical, bacteriological, and histological studies of foods preserved by low temperatures. Milk, poultry, and eggs have been the objects of investigation, with reference to their decomposition and putridity during preparation, transportation, storage, and marketing, in connection with the execution of the food and drugs act. A special investigation of frozen and dried eggs and egg products has been carried on, chiefly in the egg-breaking establishments and with the cooperation of the industry.

Scientific staff.—E. L. Connolly, S. Coopersmith, A. D. Greenlee, B. M. Hendrix, J. S. Hepburn, M. Jenkins, H. A. McAleer, H. C. Pierce, E. Q. St. John, and E. Witmer, assistants.

Leather and Paper Laboratory. F. P. VEITCH, *Chief*.

This laboratory conducts investigations of tannins and tanning materials, their effects upon the strength and properties of leather, and processes involved in their production; problems relating to the production of leather; the qualities of papers and their fitness for use in the Department of Agriculture, and other departments of the Government which may request such investigations; the production of paper; the nature and uses of turpentine and resins, together with improved processes of production; the destructive distillation of wood and methods of improving the quality and quantity of the products. Turpentine and rosin are examined under the food and drugs act. Papers, leathers, turpentine, resins, and textiles are examined for the departments of the Government requesting such work, and specifications are prepared for the purchase of these articles.

Scientific staff.—M. G. Donk, P. M. Giesy, H. P. Holman, E. O. Reed, J. S. Rogers, C. F. Sammett, and C. F. Speh, assistants.

Microchemical Laboratory. B. J. HOWARD, *Chief*.

This laboratory makes microscopical and microchemical studies of foods, drugs, cattle feed, paper and textile materials, miscellaneous agricultural products, etc. It also makes microscopical examinations of insecticides, and studies methods for their microscopical identification and estimation. Special attention is given to the histological study of fruits, spices, cereals, starches, and other agricultural products for the purpose of perfecting methods for detecting the adulteration of these products.

Scientific staff.—G. L. Keenan, E. A. Read, H. Sherman, B. H. Silberberg, and C. H. Stephenson, assistants.

Nitrogen Laboratory. T. C. TRESNOT, *Chief*.

All nitrogen determinations for the several laboratories of this bureau, as well as many from other bureaus of the department, are made in the nitrogen laboratory. Work in cooperation with the Association of Official Agricultural Chemists is also done, looking to the improvement of the methods for making these determinations. The assistant is H. W. Daudt.

Pharmacological Laboratory. WILLIAM SALANT, *Chief*.

This laboratory makes researches on the physiological action of poisonous substances occurring in food products and of drugs used as medicine, and physio-

logical tests of drugs to ascertain the strength and purity of medicinal preparations found in the open market.

Scientific staff.—Selig Hecht, Max Kahn, J. B. Rieger, and C. S. Smith.

Plant Chemistry Laboratory. J. A. LE CLERC, *Chief*.

The Plant Chemistry Laboratory studies the chemistry of plants, with respect especially to climate and environment, both in the greenhouse and in the field; changes taking place in grain during germination, malting, and storage; starch obtained from different sources for technical and food purposes; milling and breadmaking; and the drying of potatoes. Work is also done in collaboration with the Bureau of Plant Industry on problems connected with plant-physiological chemistry.

Scientific staff.—L. H. Bailey, J. F. Breazeale, B. R. Jacobs, C. C. Moore, and H. L. Wessling, assistants.

BUREAU OF SOILS.

Soil Physicist and Chief of Bureau, MILTON WHITNEY; *Chief Clerk*, A. G. RICE.

The Bureau of Soils investigates the relation of soils to climate and organic life; studies the texture and composition of soils in field and laboratory; maps the soils; studies the cause and means of preventing the rise of alkali in the soils of irrigated districts, and the relations of soils to seepage and drainage conditions.

The bureau prepares annually the report of the Field Operations of the Bureau of Soils, which contains a detailed description of the soils and of the agricultural conditions of the various areas surveyed, points out the present use of the soils, and discusses the possible changes and improvements in crops and methods of cultivation. Large-scale lithographic maps showing the distribution of the different kinds of soils accompany each report.

Laboratories. FRANK K. CAMERON, *Scientist in charge*.

The laboratories investigate the chemical properties of soils in their relation to plant growth; make chemical analysis of soil types and study their requirements with regard to fertilizers; investigate alkali problems; and direct the chemical methods used by field parties. Investigations are in progress regarding the occurrence and extent of natural deposits and of industrial by-products containing fertilizer constituents and the extraction and utilization of these constituents.

The laboratories also investigate the physical properties of soils and their economic bearing; make physical examination and mechanical analysis of soil types for soil-survey parties; prepare and test apparatus used in field work; and investigate from a physical standpoint such mechanical soil problems as arise.

Scientific staff.—H. Bryan, J. A. Cullen, R. O. E. Davis, C. C. Fletcher, Paul J. Fox, W. H. Fry, R. F. Gardiner, W. W. Niehaus, L. A. Kolbe, J. R. Lindemuth, A. R. Merz, C. F. Miller, L. B. Olmstead, W. B. Page, E. G. Parker, W. O. Robinson, W. H. Ross, J. G. Smith, L. A. Steinkoenig, J. W. Turrentine, and W. H. Waggaman.

Soil Survey. CURTIS F. MARBUT, *Scientist in charge*.

The Soil Survey surveys and maps the soils in selected areas in various parts of the United States; correlates the soils of different parts of the country and establishes their scientific classification; and locates, maps, and classifies the soils of agricultural-school farms and experiment-station farms, in cooperation with various State organizations.

Scientific staff.—Southern division, H. H. Bennett and W. E. Hearn, in charge. Northern division, W. E. McLendon and T. D. Rice, in charge. Western division, Macy H. Lapham, in charge. Use of soils, J. A. Bonsteel, in charge; J. E. Lapham, scientist.

J. H. Agee, R. T. Allen, Mark Baldwin, Miles W. Beck, R. T. A. Burke, A. L. Buser, T. N. Bushnell, L. Cantrell, W. T. Carter, jr., W. B. Cobb, L. V. Davis, E. B. Deeter, J. B. R. Dickey, J. E. Dunn, E. C. Eckmann, F. V. Emerson, W. J. Geib, B. D. Gilbert, A. L. Goodman, E. J. Grimes, E. C. Hall, R. B. Hardison, H. W. Hawker, W. H. Heileman, L. C. Holmes, L. A. Hurst, F. Z. Hutton, G. B. Jones, J. A. Kerr, N. M. Kirk, A. E. Kocher, W. J. Latimer, H. G. Lewis, C. Lounsbury, A. W. Mangum, E. T. Maxon, A. H. Meyer, C. N. Mooney, T. M. Morrison, J. W. Nelson, A. L. Patrick, R. F. Rogers, L. A. Schoenmann, E. H. Smies,

H. C. Smith, W. G. Smith, J. M. Snyder, A. T. Strahorn, A. T. Sweet, A. E. Taylor, W. E. Tharp, B. W. Tillman, E. S. Vanatta, C. Van Duyne, J. O. Veatch, C. S. Waldrop, Freeman Ward, E. B. Watson, H. L. Westover, H. J. Wilder, R. A. Winston, and P. O. Wood, assistants in the soil survey.

Fertility Investigations. OSWALD SCHREINER, *Scientist in charge.*

The Division of Fertility Investigations studies the causes of and remedy for infertility in certain soils, whether natural or arising from improper methods of cultivation and cropping. It separates, identifies, and studies certain organic substances found in unproductive soils, and corrects their evil effects by mechanical handling, by the use of fertilizers, and by other methods available to the farmer.

Scientific staff.—J. H. Beattie, B. E. Brown, L. J. Gillespie, A. M. Jackson, E. C. Lathrop, F. R. Reid, E. C. Shorey, J. J. Skinner, M. X. Sullivan, and H. Winckelmann, assistants.

BUREAU OF ENTOMOLOGY.

Entomologist and Chief, L. O. HOWARD; *Entomologist and Acting Chief in absence of Chief,* C. L. MARLATT; *Executive Assistant,* R. S. CLIFTON.

The Bureau of Entomology studies insects; experiments with the introduction of beneficial insects; makes tests with insecticides and insecticide machinery; and identifies insects sent in by inquirers.

Investigations of Insects Affecting Southern Field Crops. W. D. HUNTER, *in charge.*

These investigations deal with insect pests of cotton, tobacco, sugar cane, and rice, and are planned so as to reveal practical methods of control. Special attention is given to the Mexican cotton boll weevil and its parasitic enemies.

Cereal and Forage Insect Investigations. F. M. WEBSTER, *in charge.*

The alfalfa weevil, the range caterpillar, the chalcis fly, the alfalfa caterpillar, the alfalfa gall midge, the fall army worm, a new wireworm attacking corn, the corn leaf aphid, the chinch bug, and the Hessian fly are all objects of these investigations. A study of the white grub covers about 20 States. Other insects studied are the southern corn leaf-beetle, false wireworms, the western army cutworm, jointworms, the western corn rootworm, and wireworms. Several entirely new pests to corn, cowpeas, and soy beans are being studied. Fully equipped field stations, manned with trained investigators, are distributed over the country.

Investigations of Insects affecting Deciduous Fruits. A. L. QUAINANCE, *in charge.*

Insects injurious to orchards, vineyards, nut trees, etc., are studied in this work. Field laboratories are maintained for a series of years in important fruit regions. Demonstrations of the use of insecticides and spraying apparatus are made on a commercial scale. Important projects include investigations of grape insects, the codling moth, cranberry insects, the pear thrips, pecan insects, orchard plant lice, and scale insects.

Investigations of Insects affecting Tropical and Subtropical Fruits. C. L. MARLATT, *in charge.*

Insects affecting the citrus fruits, olive, fig, and all other tropical and subtropical fruits, as well as the use of hydrocyanic-acid gas and other means of controlling the white fly in Florida and citrus-scale insects in California, are studied in this work.

Truck-Crop and Stored-Product Insect Investigations. F. H. CHITTENDEN, *in charge.*

Field studies of insects affecting vegetable and truck crops are being made in nine States. Projected work includes the control of cutworms and onion, sugar beet, cabbage, cauliflower, asparagus, bean, and pea insects. Studies of hop and mushroom insects are also under way. Among stored products attacked by insects (such as cereals, seeds, dried fruits, nuts, tobacco, meat products, and various fabrics), a special study is being made of export flour from the Gulf region, with similar work for peanuts. New remedies for various pests are being tried.

Forest-Insect Investigations. A. D. HOPKINS, *in charge*.

Field investigations of insects attacking forest trees and forest products, with a view to practical methods of preventing losses, are extended into every State. Demonstration of the value of results already attained is attempted through cooperation with private owners and forest officers.

Investigations of Insects affecting Shade Trees and Ornamental Trees.

Under direction of the Entomologist.

These investigations include the economic treatment of borers, tree defoliators, scales, aphides, and other insects affecting trees in parks and streets, as well as ornamental plants.

Insects in Relation to Disease and Animal Parasites. Under immediate direction of the Entomologist.

This field covers the relation between certain mosquitoes and malaria and yellow fever, the house fly and typhoid fever, and the stable fly and infantile paralysis, as well as the possible relation between insects and pellagra. The investigation also deals with insects as internal and external parasites of animals and seeks practical methods for their control. A number of pests affecting domestic animals, including the cattle tick, are being studied.

Investigations in Bee Culture. E. F. PHILLIPS, *in charge*.

The structure, development, and behavior of the bee are being investigated. Special attention is given to methods of wintering, with chief emphasis at present on the proper temperature of the bee cellar. Bee diseases are being thoroughly studied. The ultimate object is to furnish helpful information to the beekeeper.

Introduction of Foreign Beneficial Insects. A. F. BURGESS, *in charge*.

Control of imported insect pests is sought through the introduction of their natural enemies. Enemies of the cotton boll weevil and of the gipsy and brown-tail moths are instances of beneficial insects which have been introduced.

Gipsy Moth and Brown-Tail Moth Investigations. Under immediate direction of the Entomologist.

The spread of the gipsy moth is prevented chiefly by clearing out strips of forests bordering roadways. A laboratory is maintained for the assemblage, study, and liberation of imported parasites of the gipsy and brown-tail moths; the work of the parasites is studied in the field.

Miscellaneous Investigations. Under immediate direction of the Entomologist.

Identification of material sent in and classification and care of museum material are instances of work coming under this head.

BUREAU OF BIOLOGICAL SURVEY.

Chief, HENRY W. HENSHAW; *Assistant Chief*, T. S. PALMER.

The work of the Bureau of Biological Survey is distributed among three divisions, dealing with the following matters: (1) Study of birds and mammals in their relation to agriculture, their food habits, etc., and recommendation of measures for the preservation of beneficial species and the destruction of harmful species; A. K. Fisher, *in charge*. (2) Making biological surveys, study of geographic distribution of animals and plants, and mapping natural life zones; E. W. Nelson, *in charge*. (3) Carrying into effect the Federal laws protecting game, regulating the importation of foreign birds and animals, and protecting migratory birds; T. S. Palmer, *in charge*.

DIVISION OF ACCOUNTS AND DISBURSEMENTS.

Chief of Division and Disbursing Clerk, A. ZAPPONE.

This division has charge of the disbursement of public funds appropriated for the Department of Agriculture.

Cashier's Section. W. J. NEVIUS, *Cashier and Chief Clerk, in charge*.

This section prepares and mails all checks and handles all moneys received and disbursed.

Bookkeeper's Section. F. W. LEGGE, *Accountant and Bookkeeper, in charge.*

This section keeps the books pertaining to the fiscal affairs of the department, prepares requisitions on the Treasury for advance of public funds, and compiles quarterly abstracts of expenditures and collections and an account current covering the liability for public funds.

Examining Section. EVERETT D. YERBY, *Supervising Auditor, in charge.*

This section examines all accounts before payment.

DIVISION OF PUBLICATIONS.

Editor and Chief, JOS. A. ARNOLD; *Editor and Assistant Chief*, B. D. STALLINGS; *Chief Clerk*, A. I. MUDD.

The Division of Publications conducts all business of the department transacted with the Government Printing Office; has general supervision of all printing, including the editing, indexing, illustration, binding, and distribution of publications, and the maintenance of mailing lists.

Editorial Work. B. D. STALLINGS, *Editor and Assistant Chief, in charge.*

This work includes editing manuscripts and giving directions for printing, correcting proofs, and inspecting completed work.

Editorial corps.—R. B. Handy, Ephraim Cornman, William F. Harding, George W. Kennedy, Stanley Searles, T. K. Burrows, Delos M. Carter, and R. S. Moore, assistant editors.

Indexing. CHARLES H. GREATHOUSE, *Assistant Editor in charge.*

Two kinds of indexes are made: (1) Indexes to be printed with individual publications; (2) a general card index, by subjects, of all publications of the department. Congressional documents are obtained for department officials, and the Congressional Record is marked daily for their attention.

Principal assistants.—Ed. S. Hoskins, Laura B. Lawson, Mary A. E. Smith, and M. M. Moseley.

Illustrations. A. B. BOETTCHER, *Assistant in charge.*

Drawings and photographs are made for use in illustrating publications and also for use in the various branches of the department's work. Photographic prints and lantern slides are sold to the public.

Document Section. FRANCIS J. P. CLEARY, *Assistant in charge.*

This section receives and distributes the publications designed for departmental use; mails circulars and documents not intended for public distribution; furnishes mailing lists and makes orders upon the Public Printer for the mailing of publications intended for the public; specifies the publications to be sent in response to miscellaneous requests; prepares correspondence relating to the publications and keeps all records of the distribution, including the Congressional quotas of Farmers' Bulletins; addresses franks and envelopes, and prepares addresses for mailing lists, of which a general index is kept up to date; and duplicates official circulars, as well as the information prepared for the press.

BUREAU OF STATISTICS.**(Bureau of Agricultural Forecasts.)**

Statistician and Chief of Bureau. LEON M. ESTABROOK; *Assistant Statistician and Acting Chief in absence of Chief*, NAT C. MURRAY; *Assistant Statistician and Assistant Chief of Bureau*, SAMUEL A. JONES; *Chief Clerk*, FRANK G. KELSEY.

The Bureau of Statistics (Bureau of Agricultural Forecasts) issues the monthly crop reports of the department, prepares the statistical portion of the Yearbook of the Department of Agriculture, and makes special investigations relating to agricultural forecasts and estimates for publication or in response to special inquiries.

Crop Reporting Board.

Monthly crop estimates for important crops are made by a Crop Reporting Board, consisting of the chief of bureau as chairman, and four other members, selected from the officials and agents of the bureau. The estimates are based on

reports from four independent sources, namely, (1) field agents, (2) State statistical agents, (3) county correspondents, and (4) township correspondents; of the latter there are many thousands. For cotton, reports are received also from (5) ginneries, (6) a special list, mostly bankers, supply men, etc., and (7) individual farmers reporting for their own farms.

Division of Forecasts.

The Division of Forecasts receives the reports of the various classes of crop correspondents and tabulates them for the use of the Crop Reporting Board. The reports of correspondents are sent in on blank schedules furnished them by this division, which also keeps the ranks of the correspondents filled up.

Field service.

The service outside of Washington consists of 22 special field agents, 47 State statistical agents, and about 150,000 voluntary correspondents. The special field agents keep in close touch with the best-informed opinion throughout their districts. The State statistical agents maintain special corps of correspondents.

Division of Estimates.

The Division of Estimates continues the work after harvest that was carried on by the Forecast Division during the crop season. It collates information on agricultural production in form available for farmers and others. The statistical portion of the Yearbook is prepared here. A well-equipped library of agricultural statistics is maintained.

LIBRARY.

Librarian, CLARIBEL R. BARNETT; Assistant Librarian, EMMA B. HAWKS.

The department Library contains 127,000 books and pamphlets, including an extensive collection on agriculture, a large and representative collection on the sciences related to agriculture, and a good collection of standard reference books. Periodicals currently received number 1,950. A dictionary catalogue is kept on cards, which number about 310,000. The Librarian has charge of the foreign mailing list.

OFFICE OF EXPERIMENT STATIONS.

Director, A. C. TRUE; Assistant Director, E. W. ALLEN; Chief Clerk, Mrs. C. E. JOHNSTON.

In all lines of its work the Office of Experiment Stations cooperates with the State agricultural colleges and experiment stations.

Relations with Institutions for Agricultural Research. E. W. ALLEN, *Assistant Director, and Editor of Experiment Station Record.*

This office supervises the expenditures of the Federal funds granted to the State agricultural experiment stations under the acts of Congress of March 2, 1887, and March 16, 1906. It publishes the Experiment Station Record, a periodical which gives abstracts of the bulletins and annual reports of the experiment stations, of the publications of the Department of Agriculture, and of miscellaneous publications reporting investigations in agricultural science in the different countries of the world. The Record contains also editorials and notes bearing upon station work.

Editorial staff of the Record.—Assistant editor, H. L. Knight; agricultural chemistry and agrotechny, L. W. Fetzer; meteorology, soils, and fertilizers, W. H. Beal and R. W. Trullinger; agricultural botany, bacteriology, and vegetable pathology, W. H. Evans and W. E. Boyd; field crops, J. I. Schulte and G. M. Tucker; horticulture and forestry, E. J. Glasson; foods and human nutrition, C. F. Langworthy and H. L. Lang; zootechny, dairying, and dairy farming, Hugh Webster; economic zoology and entomology, W. A. Hooker; veterinary medicine, W. A. Hooker and L. W. Fetzer; rural engineering, R. W. Trullinger; rural economics, B. B. Hare; agricultural education, C. H. Lane; indexer, M. D. Moore.

Editorial Division. W. H. BEAL, *Chief.*

With the exception of the Experiment Station Record, the Editorial Division edits the publications of the Office of Experiment Stations. These include the

annual report of the office, reports of investigations made by the several branches of the office, an extensive card index of experiment station literature, and miscellaneous documents.

Division of Insular Experiment Stations. WALTER H. EVANS, *Chief*.

The experiment stations in Alaska, Hawaii, Porto Rico, and Guam are conducted under the general direction of this division.

Alaska Agricultural Experiment Stations. C. C. GEORGESON, *Sitka, Special Agent in charge*.

The main station in Alaska is at Sitka. Investigations are also carried on at Rampart, in the Yukon Valley; at Kodiak; and at Fairbanks, in the valley of the Tanana River. The work consists of field experiments with vegetables, cereals, and forage plants; horticultural investigations; the maintenance of live stock; the curing of hay and silage; the distribution of seeds; and an agricultural survey of the Territory.

Assistants.—G. W. Gasser, Rampart; M. D. Snodgrass, Kodiak; J. W. Neal, Fairbanks.

Hawaii Agricultural Experiment Station. E. V. WILCOX, *Honolulu, Special Agent in charge*.

Investigations of the Hawaii Agricultural Experiment Station deal with such crops as cotton, tobacco, rice, forage crops, fiber and horticultural plants, with plant diseases, and with insects. In cooperation with the Hawaiian Government, demonstration farms have been established on the larger islands.

Staff.—D. T. Fullaway, entomologist; J. E. Higgins, horticulturist; C. J. Hunn and V. S. Holt, assistants in horticulture; C. K. McClelland, agronomist; C. A. Sahr, assistant in agronomy; W. P. Kelley, chemist; W. T. McGeorge and Alice R. Thompson, assistant chemists.

Porto Rico Agricultural Experiment Station. D. W. MAY, *Mayaguez, Special Agent in charge*.

Investigations of this station relate especially to the growing of coffee, field crops, and horticultural plants, the development of animal industry and dairying, soils, vegetable pathology, and entomology.

Staff.—C. F. Kinman, horticulturist; T. B. McClelland, assistant in horticulture; G. L. Fawcett, plant pathologist; P. L. Gile, chemist; C. N. Ageton, assistant chemist; E. G. Ritzman, animal husbandman; and R. H. Van Zwaluwenburg, entomologist.

Guam Agricultural Experiment Station. J. B. THOMPSON, *Guam, Special Agent in charge*; P. NELSON, *Assistant*; L. B. BARBER, *Veterinarian and Animal Husbandman*.

The station in Guam is located near Agaña, the principal town. Experiments are being conducted in improved methods of cultivation, introduction and improvement of tropical agricultural crops, and introduction of improved live stock.

Relations with Agricultural Colleges and Schools. C. H. LANE, *Chief Specialist in Agricultural Education*.

Information regarding the agricultural colleges and schools is collated in this office, which aims to promote the interests of agricultural education, especially the introduction of agricultural instruction into secondary and elementary schools.

Staff.—B. B. Hare, E. A. Miller, and Eugene Merritt, assistants; D. J. Crosby, collaborator.

Relations with Farmers' Institutes. JOHN HAMILTON, *Farmers' Institute Specialist*; J. M. STEDMAN, *Assistant*.

This branch reports upon the progress of farmers' institutes and aids in making them more effective for the dissemination of the knowledge of agricultural research and improved agricultural practice. It also aids in establishing movable schools and other forms of extension work for adults.

Nutrition Investigations. C. F. LANGWORTHY, *Chief*; R. D. MILNER, *Assistant*.

These investigations deal with the nutritive value of agricultural products used for human food, with special attention to their more effective utilization.

Staff.—S. C. Clark, W. P. Garrety, A. D. Holmes, and H. L. Lang, assistants in nutrition laboratory; Caroline L. Hunt and Helen W. Atwater, expert assistants.

Irrigation Investigations. SAMUEL FORTIER, *Chief*.

The Irrigation Investigations deal with (1) laws and institutions affecting irrigation; (2) the best use of irrigation water; (3) the best methods of bringing water to the place of use and applying it to crops; (4) pumping devices, their efficiency in irrigation, and possibility of their improvement; (5) use and value of various irrigation structures and devices.

Staff.—R. P. Teele, irrigation economist; Fred G. Harden, investigations of canal enterprises; Paul A. Ewing, executive assistant; Frank Huntington, editorial clerk. In charge of field work: A. P. Stover, western Oregon; C. E. Tait, southern California; S. O. Jayne, Washington; Frank Adams, California; W. W. McLaughlin, Utah; P. E. Fuller, Arizona, and power investigations; W. L. Rockwell, Texas; Don H. Bark, Idaho; Milo B. Williams, humid section; C. G. Haskell, rice investigations; R. D. Robertson, central California; V. M. Cone, Colorado; F. L. Bixby, New Mexico; John Gordon, Wyoming; H. E. Murdock, Kansas; Fred C. Scobey, special investigations of conveyance of water; S. T. Harding, Montana and North Dakota; H. W. Grunsky, Oregon; F. W. Stanley, South Atlantic States; F. L. Peterson, Nevada; and H. C. Diesem, Nebraska and South Dakota. Collaborators: W. B. Gregory, pumping plants and canals for rice irrigation; and S. H. Beckett, California. Irrigation farmers: R. G. Hemphill and R. E. Mahoney. Assistant irrigation engineers: Justin T. Kingdon, Reuben B. Sleight, Frank J. Viehmeyer, and James C. Marr.

Drainage Investigations. S. H. McCROBY, *Chief*.

The Drainage Investigations embrace the following subjects: (1) Methods of removing surplus water from lands having agricultural value; (2) protection of lands from periodical overflow of streams; (3) reclamation of tidal lands; and (4) control and conservation of rainfall on hillside lands.

Staff.—Office engineers, R. D. Marsden, A. D. Morehouse, and H. H. Barrows; draftsmen, Will D. Nichols and J. G. Hanford; senior clerk, H. S. Yohe; drainage engineers, H. A. Kipp, S. W. Frescoln, O. G. Baxter, G. M. Warren, D. L. Yarnell, J. V. Phillips, Lewis A. Jones, F. G. Eason, Chas. W. Okey, J. R. Haswell, H. M. Lynde, W. J. Schlick, and A. G. Hall; drainage engineers for irrigated lands, R. A. Hart, D. G. Miller, W. W. Weir, Sidney W. Cooper, W. A. Kelly, W. N. Hall, W. G. Sloan, and Louie T. Jessup; assistant drainage engineer, C. E. Ramser; engineers available for special work, A. E. Morgan, S. M. Woodward, C. F. Brown, L. L. Hiding, John T. Stewart, and W. B. Gregory.

OFFICE OF PUBLIC ROADS.

Director, LOGAN WALLER PAGE.

The Office of Public Roads studies systems of road management and methods of road building, improvement, and maintenance; details engineers to assist local officials in building model roads; ascertains the location, properties, and value of road materials; builds experimental roads to test substitutes for natural road materials; conducts a one-year postgraduate course in highway engineering; investigates the comparative effects of motor and horse traffic on roads; cooperates with colleges and stations, and with State highway officials; exhibits models showing types of roads, culverts, bridges, and road machines; and cooperates with the Post Office Department in carrying out the provisions of the Post Office appropriation act of August 24, 1912, relating to the improvement of post roads.

Staff.—Vernon M. Peirce, chief engineer; Laurence I. Hewes, chief of economics and maintenance; Charles S. Reeve, chemist; E. B. McCormick, mechanical engineer; Edwin W. James, chief inspector; Benjamin F. Heidel, senior highway engineer; Charles H. Moorefield, senior highway engineer; Maurice O. Eldridge, assistant in charge of road management; Fred P. Pritchard, assistant chemist; Edwin C. E. Lord, petrographer; Benjamin A. Anderson, assistant chemist; Lawrence L. Beebe, assistant mechanical engineer; William W. Sniffin, editorial clerk and librarian; W. Carl Wyatt, chief clerk.

ADVISORY BOARDS.

Referee Board of Consulting Scientific Experts.

The referee board was created February 24, 1908. It now consists of the following members: Dr. Ira Remsen, president of Johns Hopkins University, chair-

man; Dr. Russell H. Chittenden, professor of physiological chemistry in Yale University, and director of the Sheffield Scientific School; Dr. John H. Long, professor of chemistry in the Northwestern University Medical School; Dr. Alonzo E. Taylor, Benjamin Rush professor of physiological chemistry in the University of Pennsylvania; and Dr. Theobald Smith, professor of comparative pathology in Harvard University. The board considers such questions, arising in the enforcement of the food and drugs act of June 30, 1906, as may be referred to it by the Secretary of Agriculture.

Board of Food and Drug Inspection.

The Board of Food and Drug Inspection, created April 25, 1907, considers all questions other than legal questions arising in the enforcement of the food and drugs act. The board also conducts hearings based upon alleged violations of the act, as provided for by the rules and regulations approved October 17, 1906.

Members.—Carl L. Alsberg, chief of Bureau of Chemistry, chairman; Andrew S. Mitchell, chief of the St. Paul laboratory of the Bureau of Chemistry; and H. M. Loomis, chief of the San Francisco laboratory.

Committee on Buildings of the Department of Agriculture.

This committee supervises any necessary changes in department buildings, advises as to proper management of new buildings, rented quarters, etc., and considers bids pertaining to buildings.

Members.—R. M. Reese, Chief Clerk of the department, chairman; Leon M. Estabrook, Chief of Bureau of Statistics; James E. Jones, Chief Clerk of Bureau of Plant Industry; and Edgar B. Calvert, Assistant Chief of Division of Accounts, Weather Bureau.

Insecticide and Fungicide Board.

The Insecticide and Fungicide Board, created December 22, 1910, assists the Secretary of Agriculture in the enforcement of the insecticide act of 1910.

Members.—J. K. Haywood, chairman; M. B. Waite, A. L. Quaintance, and James A. Emery; executive officer, J. G. Shibley.

Board of Awards.

The Board of Awards opens, examines, and reports upon informal bids and proposals for furnishing supplies and for performing services for the department (except for the Weather Bureau and the Committee on Buildings).

Members.—R. M. Reese, Chief Clerk of the department, chairman; Leon M. Estabrook, Chief of Bureau of Statistics; James E. Jones, Chief Clerk of Bureau of Plant Industry; and Edgar B. Calvert, Assistant Chief of Division of Accounts, Weather Bureau.

Federal Horticultural Board.

The Federal Horticultural Board, created August 21, 1912, assists the Secretary of Agriculture in the enforcement of the plant quarantine act of August 20, 1912.

Members.—C. L. Marlatt, chairman; W. A. Orton, vice chairman; George B. Sudworth, W. D. Hunter, and A. V. Stubenrauch; R. C. Althouse, secretary of board.

Committee on the Editing of the Journal of Agricultural Research.

The Journal of Agricultural Research publishes technical papers giving the results of the various lines of research carried on by the department. The selection of the papers and the conduct of the Journal are intrusted to this committee.

Members.—Karl F. Kellerman, chairman; Edwin W. Allen, and Charles L. Marlatt.

Committee on Manuscripts.

This committee passes upon manuscripts submitted for publication by the department, making recommendations to the Assistant Secretary of Agriculture.

Members.—William A. Taylor, chairman; Milton Whitney, and Jos. A. Arnold.

Approved:

B. T. GALLOWAY,

Assistant Secretary of Agriculture.

WASHINGTON, D. C., November 3, 1913.

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United States Department of Agriculture.

WASHINGTON, D. C., October 23, 1913.

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- Boys' demonstration work. The corn club. (Bureau of Plant Industry. Document 644 rev.)
- Girls' demonstration work. The canning clubs. (Bureau of Plant Industry. Document 870 rev.)
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- Forestry in nature study. By E. R. Jackson. (Farmers' Bulletin 468.)
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BEES.

- Bees. By E. F. Phillips. (Farmers' Bulletin 447.)
 Comb honey. By G. S. Demuth. (Farmers' Bulletin 503.)
 Extraction of beeswax. (Farmers' Bulletin 334 (E. S. W. 48), p. 29.)
 Scabrood, a disease of bees. By G. F. White. (Bureau of Entomology. Circular 169.)
 The cause of European foul brood. By G. F. White. (Bureau of Entomology. Circular 157.)

BIRDS.

- The English sparrow as a pest. By Ned Dearborn. (Farmers' Bulletin 493.)
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 Some common birds in their relation to agriculture. By F. E. L. Beal. (Farmers' Bulletin 54.)

DAIRYING.

- Cleanliness in the dairy. (Farmers' Bulletin 273 (E. S. W. 38), p. 27.)
 Dairy salt. (Farmers' Bulletin 107 (E. S. W. 13), p. 28.)
 Measuring acidity in cheese making and butter making. (Farmers' Bulletin 381 (E. S. W. 54), p. 30.)
 Use of paraffin in dairying. (Farmers' Bulletin 273 (E. S. W. 38), p. 31.)

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- Bacteria in milk. By L. A. Rogers. (Farmers' Bulletin 490.)
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BUILDINGS.

- A plan for a small dairy house. By Ernest Kelly and K. E. Parks. (Bureau of Animal Industry. Circular 195.)

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 Farm butter making. (Farmers' Bulletin 384 (E. S. W. 55), p. 22.)
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- Cheese making on the farm. Comp. by H. E. Alvord. (Farmers' Bulletin 166.)
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VINEGAR.

- Cider vinegar. (Farmers' Bulletin 233 (E. S. W. 31), p. 28.)
- Honey vinegar. (Farmers' Bulletin 276 (E. S. W. 39), p. 23.)
- Vinegar making from waste grapes. (Farmers' Bulletin 517 (E. S. W. 72), p. 19.)

WASTES.

- Kitchen and table wastes. (Farmers' Bulletin 69 (E. S. W. 3), p. 25.)

FRUIT CULTURE.

- The home fruit garden: preparation and care. By L. C. Corbett. (Farmers' Bulletin 154.)
- The farmers' fruit garden. (Farmers' Bulletin 169 (E. S. W. 22), p. 14.)

BLUEBERRY.

- Improvement of blueberries. (Farmers' Bulletin 119 (E. S. W. 15), p. 18.)

GRAPE.

- The Scuppernong as a profitable crop [including uses of the grape]. (Farmers' Bulletin 457 (E. S. W. 64), p. 15.)

MELONS.

- The Montreal muskmelon industry. (Farmers' Bulletin 342 (E. S. W. 49), p. 16.)
- Rockyford muskmelons. (Farmers' Bulletin 193 (E. S. W. 25), p. 13.)

MULBERRY.

- Mulberries. (Farmers' Bulletin 276 (E. S. W. 39), p. 6.)

RASPBERRY.

- Raspberries. By L. C. Corbett. (Farmers' Bulletin 213.)

ROSELLE.

- Roselle: Its culture and uses. By P. J. Wester. (Farmers' Bulletin 307.)

STRAWBERRY.

- Strawberries. By L. C. Corbett. (Farmers' Bulletin 198.)

GUINEA PIGS.

- Raising guinea pigs. By D. E. Lantz. (Farmers' Bulletin 525.)

HOME GROUNDS.

- Beautifying the home grounds. By L. C. Corbett. (Farmers' Bulletin 185.)
- Lawns and lawn soils. By Oswald Schreiner [and others]. (Farmers' Bulletin 494.)
- Dandelions in lawns. (Farmers' Bulletin 186 (E. S. W. 23), p. 18.)

HOUSEHOLD INSECTS.

Hydrocyanic-acid gas against household insects. By L. O. Howard and C. H. Popenoe. (Bureau of Entomology. Circular 163.)

ANT.

House ants. By C. L. Marlatt. (Bureau of Entomology. Circular 34 rev.)

BEDBUG.

The bedbug. By C. L. Marlatt. (Bureau of Entomology. Circular 47 rev.)

CARPET BEETLE.

The carpet beetle or "buffalo moth." By L. O. Howard. (Bureau of Entomology. Circular 5 rev.)

CENTIPEDE.

The house centipede. (Bureau of Entomology. Circular 48.)

FLEA.

House fleas. By L. O. Howard. (Bureau of Entomology. Circular 108.)

FLIES.

House flies. By L. O. Howard. (Farmers' Bulletin 459.)

Combating flies. (Farmers' Bulletin 532 (E. S. W. 75), p. 22.)

A device for ridding houses of flies. (Farmers' Bulletin 133 (E. S. W. 18), p. 25.)

The typhoid or house fly. (Farmers' Bulletin 412 (E. S. W. 58), p. 11.)

HARVEST MITE.

Harvest mites, or "chiggers." By F. H. Chittenden. (Bureau of Entomology. Circular 77.)

MOTHS.

The true clothes moths. By C. L. Marlatt. (Bureau of Entomology. Circular 36 rev.)

SILVERFISH.

The silverfish. By C. L. Marlatt. (Bureau of Entomology. Circular 49.)

WHITE ANT.

The white ant. By C. L. Marlatt. (Bureau of Entomology. Circular 50 rev.)

HYGIENE AND SANITATION.

How insects affect health in rural districts. By L. O. Howard. (Farmers' Bulletin 155.)

How to prevent typhoid fever. By L. W. Page, J. R. Mohler, and E. F. Smith. (Farmers' Bulletin 478.)

The sanitary privy. By C. W. Stiles and L. L. Lumsden. (Farmers' Bulletin 463.)

Sewage disposal for rural homes. (Farmers' Bulletin 527 (E. S. W. 74), p. 19.)

Some common disinfectants. By M. Dorset. (Farmers' Bulletin 345.)

Some facts about malaria. By L. O. Howard. (Farmers' Bulletin 450.)

Trichinosis: A danger in the use of raw pork for food. By B. H. Ransom. (Bureau of Animal Industry. Circular 108.)

ICE.

Ice houses. By L. C. Corbett. (Farmers' Bulletin 475.)

Ice for household use. (Farmers' Bulletin 309 (E. S. W. 43), p. 5.)

INDUSTRIAL ALCOHOL.

Industrial alcohol: uses and statistics. By H. W. Wiley. (Farmers' Bulletin 269.)

PAINT AND WHITE WASHES.

The use of paint on the farm. By P. H. Walker. (Farmers' Bulletin 474.)
White and color washes. (Farmers' Bulletin 499 (E. S. W. 69), p. 23.)

POULTRY.

Hints to poultry raisers. By H. M. Lamon. (Farmers' Bulletin 528.)
Poultry management. By G. A. Bell. (Farmers' Bulletin 287.)
Standard varieties of chickens. By G. E. Howard. (Farmers' Bulletin 51.)

ACCOUNTING.

A system of poultry accounting. By R. R. Slocum. (Bureau of Animal Industry. Circular 176.)

DISEASES AND PESTS.

Important poultry diseases. By D. E. Salmon. (Farmers' Bulletin 530.)
The fowl tick. By F. C. Bishopp. (Bureau of Entomology. Circular 170.)
Mites and lice on poultry. By Nathan Banks. (Bureau of Entomology. Circular 92.)

DUCKS AND GEESE.

Ducks and geese: standard breeds and management. By G. E. Howard. (Farmers' Bulletin 64.)

EGGS.

Color of eggs. (Farmers' Bulletin 262 (E. S. W. 36), p. 27.)
Market eggs and their improvement. (Farmers' Bulletin 517 (E. S. W. 72), p. 13.)

FEEDING.

Rations for laying hens. (Farmers' Bulletin 186 (E. S. W. 23), p. 23.)
Relation of feed to the flavor of eggs. (Farmers' bulletin 122 (E. S. W. 16), p. 25.)

GUINEA FOWL.

The guinea fowl and its use as food. By C. F. Langworthy. (Farmers' Bulletin 234.)
Rearing and marketing guinea fowls. (Farmers' Bulletin 262 (E. S. W. 36), p. 25.)

INCUBATION.

Incubation and incubators. By R. H. Wood. (Farmers' Bulletin 236.)

MARKETING.

Dressing and packing poultry for shipment. (Farmers' Bulletin 144 (E. S. W. 19), p. 25.)
Marketing of eggs. (Farmers' Bulletin 405 (E. S. W. 57), p. 19.)
Marketing eggs through the creamery. By R. R. Slocum. (Farmers' Bulletin 445.)
Preparing fowls for market. (Farmers' Bulletin 353 (E. S. W. 50), p. 12.)
Selling eggs by weight. (Farmers' Bulletin 122 (E. S. W. 16), p. 24.)

PHEASANTS.

Pheasant raising in the United States. By Henry Oldys. (Farmers' Bulletin 390.)

SQUABS.

Squab raising. By W. E. Rice. (Farmers' Bulletin 177.)

TURKEY.

Turkeys: standard varieties and management. By T. F. McGrew. (Farmers' Bulletin 200.)

RABBITS.

Raising Belgian hares and other rabbits. By D. E. Lantz. (Farmers' Bulletin 496.)

RATS.

How to destroy rats. By D. E. Lantz. (Farmers' Bulletin 369.)

ROADS.

Benefits of improved roads. (Farmers' Bulletin 505.)

SCHOOL GARDENS.

The school garden. By L. C. Corbett. (Farmers' Bulletin 218.)

TREES.

Tree planting on rural school grounds. By W. L. Hall. (Farmers' Bulletin 134.)

Street trees. (Farmers' Bulletin 360 (E. S. W. 51), p. 9.)

VEGETABLE CULTURE.

The home vegetable garden. By W. R. Beattie. (Farmers' Bulletin 255.)

The farmer's vegetable garden. (Farmers' Bulletin 149 (E. S. W. 20), p. 6.)

The germination of packeted vegetable seeds. By Edgar Brown and W. L. Goss. (Bureau of Plant Industry. Circular 101.)

ASPARAGUS.

Asparagus culture. By R. B. Handy. (Farmers' Bulletin 61.)

CELERY.

Celery. By W. R. Beattie. (Farmers' Bulletin 282.)

CUCUMBER.

Cucumbers. By L. C. Corbett. (Farmers' Bulletin 254.)

MUSHROOMS.

The cultivation of mushrooms. By B. M. Duggar. (Farmers' Bulletin 204.)

OKRA.

Okra: its culture and uses. By W. R. Beattie. (Farmers' Bulletin 232.)

RHUBARB.

Forcing rhubarb. (Farmers' Bulletin 107 (E. S. W. 13), p. 13.)

TOMATO.

Tomatoes. By L. C. Corbett. (Farmers' Bulletin 220.)

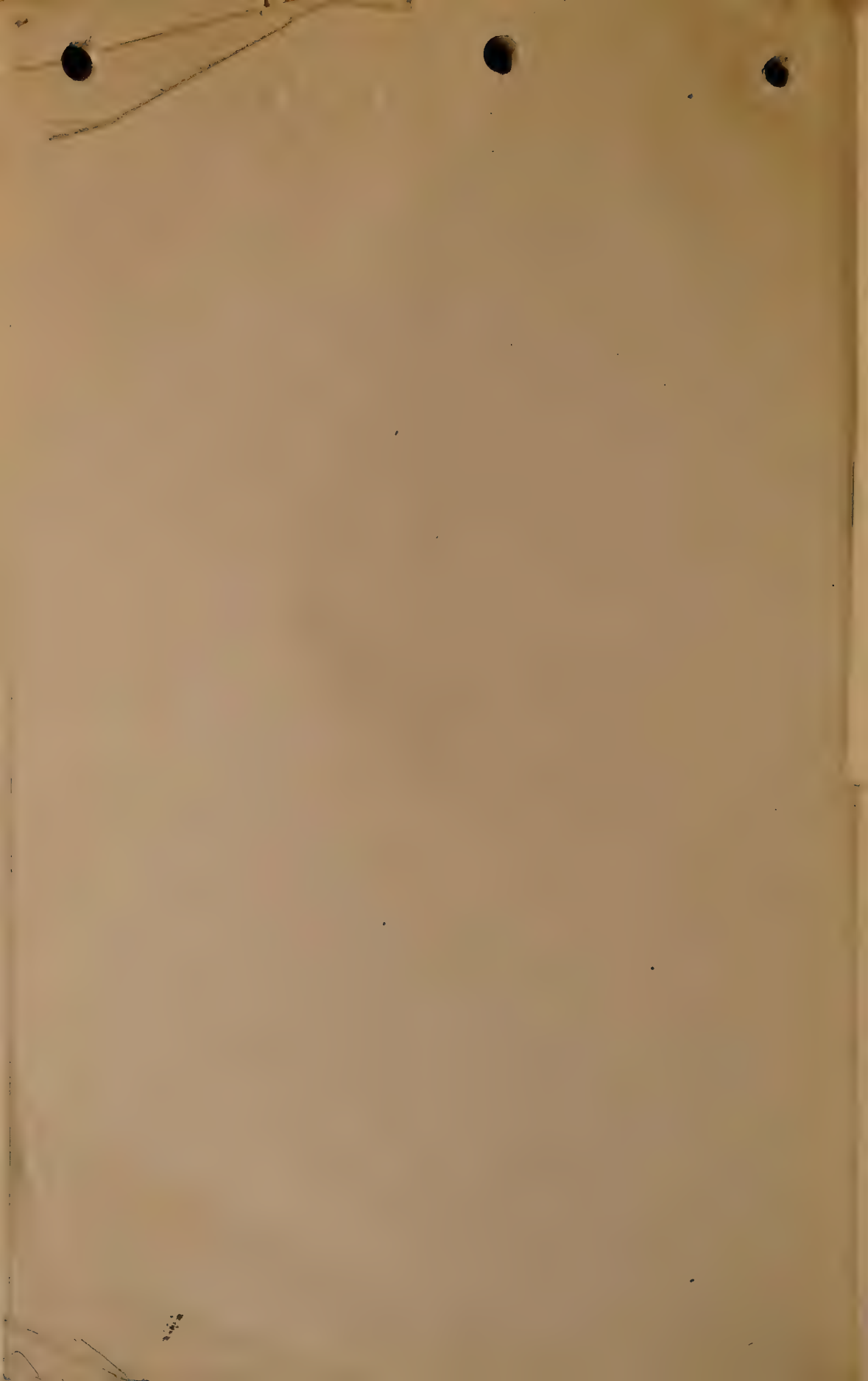
Growing tomatoes for the canning factory. (Farmers' Bulletin 435 (E. S. W. 62), p. 24.)

WATER.

Pure water on the farm. (Farmers' Bulletin 73 (E. S. W. 4), p. 3.)

Water for table use. (Farmers' Bulletin 262 (E. S. W. 36), p. 5.)

Wells and a pure water supply. (Farmers' Bulletin 296 (E. S. W. 41), p. 5.)



UNITED STATES DEPARTMENT OF AGRICULTURE,
FOREST SERVICE.

THE COUNTRY'S FORESTS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.

1914.



THE COUNTRY'S FORESTS.

THE NATIONAL FORESTS.

WHERE THEY ARE.

There are 163 National Forests, mostly situated in the mountains of the West. Others are in Michigan, Minnesota, Kansas, Nebraska, Arkansas, Florida, Alaska, and Porto Rico.

Their total area is over 186,000,000 acres, which is as much as all the New England States and New York, Pennsylvania, Delaware, Maryland, and Virginia combined. The average size of a National Forest is 1,150,000 acres, or about 1,800 square miles.

The Government is now buying land in the Southern Appalachian and White Mountains for National Forests in the East.

WHAT THEY ARE FOR.

National Forests are set apart to insure a perpetual supply of timber for the use and necessities of the people of the United States, and to prevent destruction of the forest cover which regulates the flow of streams.

WHAT THEY CONTAIN.

All told, the National Forests contain approximately 600 billion feet of merchantable timber, worth at least \$900,000,000. The other resources are worth probably \$1,100,000,000 more, bringing their total value up to something like \$2,000,000,000.

They also contain 1,175 watersheds which supply cities and towns, and 324 water-power and 1,266 irrigation projects developed or in course of development.

HOW THEY ARE ADMINISTERED.

The Forest Service of the Department of Agriculture administers the National Forests:

It protects them from fire and other destructive agencies.

It builds roads, trails, telephone lines, bridges, and other works to make them accessible.

It conducts the sale and oversees the cutting of mature timber, in accordance with the principles of forestry.

It regulates the grazing of live stock in a way to improve the range and protect the settler and home builder from unfair competition in its use.

It issues permits for the development of water power and for the construction of hotels,

THE COUNTRY'S FORESTS.

dwelling, stores, factories, telephone lines, conduits, public roads, reservoirs, power transmission lines, and the like.

The resources of the National Forests are not locked up. The timber, water, and pasture are for the use of the people, and the minerals are open to development just as on unreserved public land.

HOW THEY WERE USED IN 1913.

Over 495,000,000 feet of National Forest timber, worth more than \$1,075,000, was cut under sale by different purchasers. Contracts were closed with 6,000 individual purchasers for the sale of more than 2 billion feet of timber, worth nearly \$4,500,000, to be removed during a period of years.

Over 121 million feet of timber, worth \$192,000, were given away to 38,000 settlers, miners, and others to develop their farms and claims.

More than 1,550,000 cattle, horses, and swine and 7,860,000 sheep and goats were grazed on the Forest ranges by 27,000 stockmen.

Seventy-six power plants, 800 hotels, rest houses, and summer resorts, and 1,400 stores and other business buildings were operating on the Forests under permit.

One thousand seven hundred new mining claims were patented within the Forests,

THE COUNTRY'S FORESTS.

where the total mining population was more than 24,000.

Twenty thousand permanent settlers occupied farms within the Forest boundaries.

One and one-half million campers, hunters, fishermen, and other pleasure seekers used the Forests as recreation grounds.

Anyone desiring information concerning the sale of National Forest timber should write to the Forester, Washington, D. C., or to the district forester at any of the following places: Missoula, Mont.; Denver, Colo.; Albuquerque, N. Mex.; Ogden, Utah; San Francisco, Cal.; or Portland, Oreg.

HOW THEY WERE PROTECTED AND IMPROVED IN 1913.

Forest officers extinguished 2,472 fires during the year.

Fifty per cent of these had burned over less than one-quarter of an acre before they were put out.

Forest officers killed 4,686 predatory animals, including mountain lions, coyotes, and wolves, in order to protect stock grazed on the Forests.

More than 350 miles of road, 275 miles of fire line, 3,800 miles of telephone line, and 2,600 miles of trail were built.

THE COUNTRY'S FORESTS.

Almost 30,000 acres were sown or planted to young trees.

More than 2,000 miles of road, 773 miles of fire line, 15,000 miles of telephone line, and 16,000 miles of trail have been built, and 87,000 acres planted or sown on the National Forests since they were transferred to the administration of the Department of Agriculture in 1905.

WHAT THEY BRING TO THE STATES.

Twenty-five per cent of all receipts from National Forests go to the counties in which they lie, to be used for schools and roads.

In 1913 this amounted to \$586,593.39.

An additional 10 per cent is expended by the Secretary of Agriculture upon roads and trails constructed primarily for the benefit of settlers within the Forests. In 1913 more than \$234,000 was available for the purpose.

FOREST FIRES.

THE LOSS.

Forest fires in the United States have destroyed on an average each year at least \$25,000,000 worth of timber, and have caused a loss in stock, crops, buildings, and other improvements of many millions more.

THE COUNTRY'S FORESTS

In the past 50 years more than 3,000 persons have been burned to death in forest fires.

The Peshtigo, Wis., fire in 1871 burned over 1,280,000 acres and cost 1,500 human lives. The Hinckley, Minn., fire in 1894 burned over 160,000 acres, with a death list of 418. The great Idaho, Montana, and Minnesota fires of 1910 swept 2,300,000 acres and burned to death 127 persons.

Every fire in the forest, no matter how small, may develop into a serious conflagration. All that is needed is a strong wind and material to feed upon.

In the State of Michigan alone, forest fires during the 10 years between 1901 and 1911 caused a loss of \$20,000,000.

In Massachusetts forest fires in the last three years have caused a damage of over \$823,000.

Forest fires are unnecessary, are nearly always the result of carelessness, and may wipe out in an hour what nature has taken hundreds of years to create.

They destroy existing forests.

They destroy the possibility of future forests.

They destroy a great market for labor.

They destroy the beauty of a region.

They destroy homes.

They destroy lives.

They destroy prosperity.

THE COUNTRY'S FORESTS.

THE CAUSES.

The three chief causes of forest fires are railroads, campers, and lightning.

Among them they are responsible for more than half the fires that start.

Sparks from the smokestack and live coals from the fire box are responsible for the fires which start along railroad rights of way.

Hunters, pleasure seekers, and others leave camp fires burning, or throw lighted matches or tobacco into inflammable material in the forest. A disastrous fire may result from such practices.

All fires start as small fires.

THE REMEDY.

Forest fires can be prevented by:

Never leaving a camp fire until it is out.

Never making a camp fire in leaves, rotten wood, or against a log.

Never tossing away burning matches or tobacco.

Never burning brush, grass, or slashings during a dry season.

WHAT IS BEING DONE.

The Federal Government, 20 of the States, and 30 timber owners' associations maintain a system of patrol and take other preventive

measures on their lands during danger seasons of the year.

The area thus protected by the Government approximates 165,000,000 acres; that protected by the States (largely in cooperation with the Government as provided by section 2 of the Weeks law) 100,000,000 acres; and that protected by the timber owners' associations, 25,000,000 acres.

As a result of such protection the loss on the National Forests in 1912 was kept down to \$75,000, and on State and private lands to less than \$200,000.

Had these lands not been protected the loss, based on the average annual fire loss in the whole country, would have been many times this figure.

Under section 2 of the Weeks law, the Forest Service is cooperating with 17 States in protecting from fire the forest cover on the watersheds of navigable streams.

FORESTRY IN THE STATES.

Twenty-five States have active forest departments, the majority of which employ professional foresters.

Twenty have efficient fire-protective systems.

THE COUNTRY'S FORESTS.

Fourteen have established State forests, with an aggregate area of more than 3,400,000 acres.

Ten maintain forest-tree nurseries which produce each year nearly 10,000,000 small trees, about half of which are distributed to private owners at cost.

Pennsylvania has 983,529 acres of State forests, has planted to date 2,800 acres with young trees, produces 2,500,000 forest tree seedlings from its nurseries every year, has a number of State forest experiment stations, and makes an annual appropriation for forestry of about \$328,000.

New York has 1,664,000 acres of State forests, has planted to date 7,000 acres, produces 4,500,000 young trees yearly, has established a State forest experiment station, and makes an annual appropriation for forestry of about \$164,000.

Massachusetts has 15,000 acres of State forests and 56 separate municipal forests. Each year it produces from its nurseries upward of 1,300,000 young trees. The annual appropriation for forestry amounts to about \$55,000.

Minnesota has 43,000 acres of State forests, and makes an annual appropriation for forestry of about \$233,000. Citizens of the State

THE COUNTRY'S FORESTS.

have planted 250,000 acres of their lands with trees.

Wisconsin has 400,000 acres of State forests, and makes an annual appropriation of \$95,000 for forestry.

STATE FOREST ORGANIZATIONS.

Those who wish further information concerning forestry in any particular State should write to the proper official listed on pages 13 and 14.

State forest organizations and officials.

State.	Officer in charge.	Address.
Alabama.....	Secretary, commission of forestry.....	Montgomery.
California.....	State forester.....	Sacramento.
Colorado.....	do.....	Fort Collins.
Connecticut.....	Forester of agricultural experiment station.....	New Haven.
Hawaii.....	Superintendent of forestry.....	Honolulu.
Idaho.....	State land commissioner.....	Boise.
Indiana.....	Secretary, State board of forestry.....	Indianapolis.
Iowa.....	State forestry commissioner.....	Des Moines.
Kansas.....	State forester.....	Manhattan.
Kentucky.....	do.....	Frankfort.
Louisiana.....	President, State conservation commission.....	New Orleans.
Maine.....	State forest commissioner.....	Augusta.
Maryland.....	State forester.....	Baltimore.
Massachusetts.....	do.....	Boston.
Michigan.....	do.....	Lansing.
Minnesota.....	do.....	St. Paul.
Montana.....	do.....	Helena.
New Hampshire.....	do.....	Concord.
New Jersey.....	Forester, forest park reservation commission.....	Trenton.
New York.....	Superintendent, State forests.....	Albany.
North Carolina.....	Forester of State geological and economic survey.....	Chapel Hill.
North Dakota.....	State forester.....	Botlineau.

State forest organizations and officials—Continued.

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THE COUNTRY'S FORESTS.

State.	Officer in charge.	Address.
Ohio.....	Forester of agricultural experiment station.....	Wooster.
Oregon.....	State forester.....	Salem.
Pennsylvania.....	Commissioner of forestry.....	Harrisburg.
Rhode Island.....	do.....	Chepachet.
South Dakota.....	State forester.....	Custer.
Tennessee.....	Commissioner of game, fish, and forestry.....	Nashville.
Vermont.....	State forester.....	Burlington.
Virginia.....	Commissioner of agriculture.....	Richmond.
Washington.....	State forester and game warden.....	Olympia.
West Virginia.....	Forest, game, and fish warden.....	Belington.
Wisconsin.....	State forester.....	Madison.

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UNITED STATES DEPARTMENT OF AGRICULTURE,
FOREST SERVICE.

OUR TIMBER SUPPLY.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.

1914.



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OUR TIMBER SUPPLY.

AMOUNT AND OWNERSHIP.

The total amount of standing timber in the United States is close to 2,900 billion board feet.

At least 76 per cent of this, or 2,200 billion feet, is privately owned.

About 21 per cent, or 600 billion feet, is in the National Forests.

About 3 per cent, or 90 billion feet, is in some other form of public ownership—Federal, State, or municipal.

The original stand of timber in the United States has been roughly estimated to have been 5,200 billion feet, covering approximately 800,000,000 acres.

Fire has destroyed at least as much of this as lumbering has utilized.

As much again has been wasted.

WHERE IT IS.

Almost five-elevenths of the country's timber is in the Pacific northwest (Washington, Oregon, Idaho, and northern California), where the chief trees are Douglas fir, western red cedar, western yellow pine, sugar pine, larch, and redwood.

OUR TIMBER SUPPLY.

Of the remaining timber, a little more than half, or about one-fourth of the total supply, is in the Southern pine region (Louisiana, Mississippi, Arkansas, Florida, Texas, Alabama, and parts of Georgia, North Carolina, South Carolina, Virginia, and Missouri), where the principal trees are longleaf, shortleaf, and loblolly pine (all marketed under the name of yellow pine), cypress, and gum, oak, and other hardwoods.

The Lake States contain perhaps 100 billion feet of timber, mostly white, jack, and Norway pine, hemlock, balsam, beech, birch, and maple.

The Northeastern States are the chief source of supply for spruce, from which most of our paper pulp is made.

Most of the National Forests are in the mountains of the West, following in general the Rocky Mountains and Pacific coast ranges from Washington, Idaho, and Montana to southern California, Arizona, and New Mexico. A few are in Arkansas, Florida, Nebraska, Michigan, Minnesota, Alaska, and Porto Rico.

States which have set aside forest reserves of their own are California, Connecticut, Indiana, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, South Dakota, Vermont, and Wisconsin.

ANNUAL CUT.

The annual cut of sawtimber in the United States is approximately 43 billion feet.

At this rate, if there were no new growth, our present timber supply would last about 65 years.

Though it contains practically half of all the standing timber in the country, the Pacific northwest at present furnishes only one-sixth of the annual cut.

The southern pine region is the present center of the lumber industry, furnishing about 45 per cent of the annual production.

The Lake States, once the center of lumbering, now supply a relatively small amount of timber as compared with the Southeast, and less than the Pacific States.

In 1912 the chief lumber-producing States, in the order of their importance, were Washington, Louisiana, Mississippi, North Carolina, Oregon, Texas, Arkansas, Virginia, Wisconsin, Michigan, Minnesota, Alabama, West Virginia, California, and Florida.

Yellow pine furnishes more than 37 per cent of all our lumber, and Douglas fir more than 13 per cent.

Washington supplies the most Douglas fir and western red cedar; Louisiana, the most yel-

low pine, tupelo, and cypress; Mississippi, the most cottonwood; Arkansas, the most hickory and red gum; Wisconsin, the most basswood, birch, and hemlock; Michigan, the most beech, elm, and maple; Minnesota, the most white pine; and West Virginia, the most oak, yellow poplar, and chestnut.

The people of the United States use in a normal year about 40 billion feet of lumber, 90,000,000 cords of firewood, 135,000,000 hewn railroad ties, 889,000,000 posts, 3,500,000 telegraph and telephone poles, 1,686,000,000 staves, 136,000,000 sets of heading, 353,000,000 barrel hoops, 3,300,000 cords of native pulpwood, 165,000,000 cubic feet of round mine timbers, and 1,250,000 cords of wood for distillation.

The yearly growth of wood in our forests has been estimated to average not more than 12 cubic feet per acre. We are taking out about 36 cubic feet per acre, and are therefore cutting the forests three times as fast as they grow.

FUTURE SUPPLY.

Through the inevitable economic development of the country, the amount of land chiefly valuable for growing forests may be expected

OUR TIMBER SUPPLY.

to shrink from its present extent of 550,000,000 acres (including farm woodlots) to approximately 450,000,000 acres, or, assuming a population of 150,000,000, to 300 acres for every 100 inhabitants.

To maintain our present per capita consumption of 260 cubic feet of wood, however, there would have to be 2,166 acres of forest for every 100 inhabitants, or more than seven times the probable future area.

The present forest area is 775 acres for every 100 inhabitants. It meets our own needs only because it still offers a supply of virgin timber, the accumulated capital of centuries, to supply the deficiency.

With increasing scarcity as this supply is drawn lower, economy in the use of woods will be forced. As wood becomes more expensive, growing it will become more profitable. Thus eventually a balance between production and consumption will be reached.

A supply of wood sufficient for our future needs will be the result of:

1. Reducing the per capita consumption.
2. Protecting the forests from fire.
3. Increasing the annual growth per acre through the practice of forestry.

OUR TIMBER SUPPLY.

By greater economy in the use of wood the per capita consumption could easily be reduced from the present figure of 260 cubic feet to 150 or even 100 cubic feet without hardship. We use only 50 per cent of the total volume of the tree and leave 50 per cent to be wasted.

Forest fires every year destroy, on an average, 12 billion board feet of timber. If the forests were protected there would be just this much more timber available. Protection from fire gives the forests a chance to grow.

The aim of forestry is to bring the forest up to its highest state of productiveness and keep it there. In the United States, where forestry is not practiced except on Government and State lands, the estimated annual production, as stated before, is 12 cubic feet per acre. In Saxony, where forestry has been practiced for many years, the annual production is 93 cubic feet.

If our final forest area of 450,000,000 acres is made to yield an average of 50 cubic feet per acre, as it can by the practice of scientific methods, there will be enough wood for a per capita consumption of 150 cubic feet by 150,000,000 people.



3 Potter

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
WASHINGTON

ADDRESS REPLY TO
THE FORESTER
AND REFER TO:

FILED
JAN 25 1915

October 16, 1914.

FP
Publications

MEMORANDUM FOR THE ASSISTANT SECRETARY

Dear Mr. Secretary:

I question whether the plan embodied in Mr. Kellerman's letter to you of September 15, and its accompanying "Memorandum in Regard to Publications", will prove in practice to be sufficiently inclusive and flexible to meet all the needs of the Department.

Apparently the plan would restrict all publications prepared for the public to the five specified series, except for certain other publications enumerated in the memorandum, and would restrict the printing of instructions and circulars of information for internal use to letter-size paper. I believe that need will arise from time to time for getting out publications which do not conform to the scheme.

It would be highly disadvantageous to the Forest Service if all publications issued for the use of our men in office and field had to be printed upon standard letter-size paper. Such publications are working tools, and should be adapted to the conditions of use. The

The Assistant Secretary.

National Forest Manual is just being published in loose-leaf form with the same size of page as the bulletins of the Department. The Field Program is issued quarterly with a $4\frac{1}{2}$ by $6\frac{1}{2}$ inch page, for convenience in field use. Other publications for field use, such as the "Instructions for the Scaling and Measurement of National Forest Timber", require to be protected by stiff covers as well as put in a form which can be carried in the pocket, since the men must carry these books with them in the woods. The Department's "Administrative Regulations" is another example of a publication for internal use which requires to be issued in pocket size.

In the case of publications issued for the information of the public, also, effective use sometimes calls for a publication of unusual form. The Woodsman's Handbook, of which nearly fifty thousand copies have been distributed, would have had its value greatly impaired if it had not been printed in pocket size. "Our Timber Supply" and "The Country's Forests", of which copies are enclosed, are examples of publications containing general information the most effective use of which calls for a size permitting enclosure in a No. 6 envelope.

The proposal to number all office circulars seems to lose sight of the fact that such circulars are often not really publications at all, but correspondence. Print

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The Assistant Secretary.

may be used instead of typewriter, mimeograph, or multigraph solely because it is cheaper. The fact that such printed circulars may contain matter suitable for incorporation in an official publication does not necessarily lead to the conclusion that all office circulars should be regarded as Departmental publications. Typewritten letters also may contain such matter. When they do the natural procedure would seem to be to get out a regular publication embodying the information in its proper form, not to add the letters themselves to the list of publications. I see no more occasion for putting Departmental serial numbers on all circulars than for doing the same thing with all mimeographed communications sent out by the various bureaus, to their own men or to outside correspondents.

In my judgment the publication system of the Department should not be too hard and fast. Artificial restrictions either upon the length or upon the subject-matter or upon the size and shape of publications may both prevent the publication of material which should be got out and lessen the usefulness of the publications which are got out. Any scheme should make room for exceptions when exceptions are called for. A certain amount of uniformity is desirable, but not too much. Publications are not ends in themselves but instruments for getting results and should be fashioned

1. The first part of the

document is a letter from the

author to the editor of the

journal, in which the author

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The Assistant Secretary.

with this in view. As a great publishing house the Department should have a reasonably varied output.

The requirements set forth for the series of Reports of the Department seem unduly restricted. They would, for example, bar the "List of Workers in Subjects Pertaining to Agriculture, etc"., which Mr. Arnold mentions as best adapted for inclusion in this series. Is not this series in point of fact revived in order to provide a place for publications which it is desired to issue but which would not fit in elsewhere?

The final paragraph of the memorandum classifies as suitable for outside publication "articles which do not fall within the scope of the preceding outline." A more satisfactory distinction would seem to be between material the usefulness of which will be substantially enhanced if the Department publishes it and for the publication of which Department funds are available, and material which will be practically as useful to the public if published in outside channels or for which printing funds are not available.

I strongly concur in Mr. Kellerman's recommendation that the rule against covers for the Department bulletins be rescinded, or at least modified to permit of covers when they are obviously needed to secure the best results in the way of use of the publication. In the matter of cover as

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The Assistant Secretary.

in that of short or long table of contents, and also of index, the question might perhaps well be decided on the basis of what in each case is actually the most efficient use of the Department's printing funds.

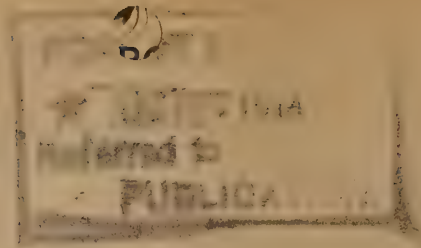
Very respectfully,

A handwritten signature in dark ink, appearing to read "A. H. Potter". The signature is written in a cursive style with a long, sweeping underline.

Associate Forester.

Enclosures.

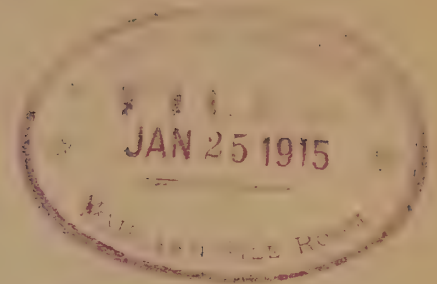
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DEPARTMENT OF AGRICULTURE
WASHINGTON

October 6, 1914.

MEMORANDUM FOR MR. GRAVES



Dear Mr. Graves:

The Assistant Secretary has now under consideration several questions relating to the publications of the Department, particularly with reference to the number of these publications in order to prevent confusion. In this connection your attention is called to a proposed memorandum covering the question of publications. Kindly return all papers with your comment.

Very truly yours,

W. J. Callahan

Private Secretary.

(Enclosure)

1832 10 1

Kellerman

JOURNAL OF AGRICULTURAL RESEARCH.

PUBLISHED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE ASSOCIATION OF
AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.

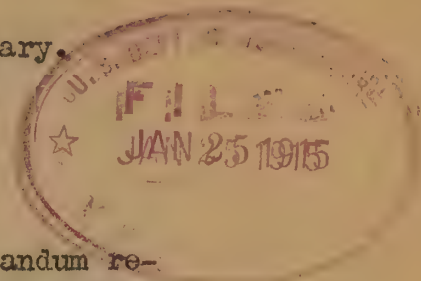
Washington, D. C., November 2, 1914.

Memorandum for the Assistant Secretary.

Dear Mr. Vrooman:

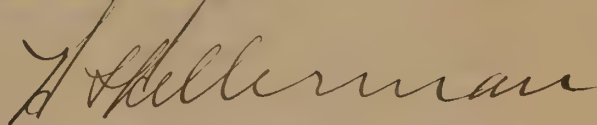
I have read Mr. Wharton's memorandum regarding the establishment of a new series of publications. The Departmental Bulletins are supposed to supply information and direction of the type and to the audience described by Mr. Wharton for his new series, with the exception that the Departmental Bulletins are supposed to be fairly complete in themselves instead of being brief reviews. Reviews of Departmental publications and Experiment Station bulletins were published a few years ago and the series was rather widely circulated. There is no doubt but that many people found it useful, especially in so far as the Station bulletins were reviewed, thus making the information contained in them available for people of other states. This series of reviews was discontinued as in the opinion of the Congressional committee dealing with printing it appeared to be a wasteful system. It appeared that the original publications either were not properly utilized or were unnecessary altogether if the review publications were to be considered really necessary.

A second feature of Mr. Wharton's proposed publication is that reviews of papers delivered by officials at various Congresses, and reviews of papers published in outside journals be included. As a general system I believe this plan is inadvisable. Delivering an address at a meeting does not preclude publication of identical or similar material in the Department series of publications. If the subject matter of the address or paper is considered desirable it can be published with little or no change in our present series, but in many cases the addresses are either too academic or their value is too ephemeral to make it desirable to place them in the Department series.



The proper utilization of agricultural papers, especially the county papers, I believe would render the need of a publication of this type less pressing, and it is possible that for general circulation it would not be needed at all. It is of course obvious that there is a discrepancy in our system of publication in that it does not offer any means of quickly getting into the hands of the county agents and other demonstrators information developed by this Department and by the experiment stations. The new organization of States Relation Service and the States Relation Service Committee I believe are now working up this idea and hope to develop a plan by which either a new series or a development of the so-called reading courses of the Office of Experiment Stations may be made to effectively disseminate the important information to these men. Until these plans are more completely developed I believe it would be unwise to attempt to inaugurate the new journal which Mr. Wharton has in mind; in fact I am never favorable to the rapid multiplication of new series. Wherever there is a chance of doing so, I believe it is better to make slight modifications in existing series, when special needs arise, and thus enlarge their scope and usefulness.

Yours very truly,

A handwritten signature in cursive script, appearing to read "J. H. Sherman".

Chairman, Editorial Committee.

JOURNAL OF AGRICULTURAL RESEARCH.

PUBLISHED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE ASSOCIATION OF
AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.

Kellerman
Washington, D. C., November 2, 1914.

Memorandum for the Assistant Secretary.

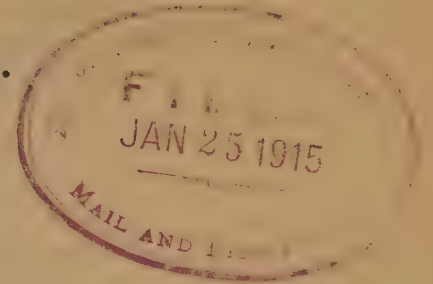
Dear Mr. Vrooman:

From a careful examination of the comments submitted by the Chiefs of the different Bureaus, it appears to me that the outline I have indicated in regard to publications meets with general approval.

The members of the different regulatory boards do not seem to be impressed by my suggestion that the Service and Regulatory Announcements should be included in the series of Department Bulletins, and, though I believe there is a good reason for this inclusion, Mr. Arnold's contention that the confusion resulting from changing the various series at this time would be greater than the advantage to be gained from the change is, I believe, well founded. I desire, therefore, to withdraw my suggestion that the Service and Regulatory Announcements be included in the numbered series of the bulletins.

I agree with the suggestion made by Mr. Potter, that the limitation of office circulars to standard letter-size paper is undesirable. The intention of this suggestion in my original memorandum was to prevent the issuance of office circulars, using the format of the Department Bulletins. My memorandum should be changed to read:

"Office circulars, whether printed or mimeographed, should differ in make-up from the publications described above, either in size or color of paper; should be numbered in inconspicuous type, and at least ten copies filed with the Document Section of the Library."



Mr. Potter's further suggestion, that greater freedom be allowed in the publication of Departmental Reports, represents exactly the idea I had in mind and the idea of Mr. Arnold and members of the editorial committee which passes upon these reports. Omitting a few words in the paragraph describing this series so that it shall read "reports of value to agriculture" will prevent any undesirable discrimination against unusual types of papers that may from time to time appear.

The different series as now described are sufficiently elastic to include in one series or another practically any type of publication, and if the system of numbering is rigidly adhered to it will be possible to keep accurate record of what information is being disseminated by the Department, and eventually it will be possible to determine which forms are most useful.

I have rewritten the memorandum, including the changes that have resulted from this discussion. I believe it should be understood that these are regulations rather than statutes and that if they are put into effect, the spirit of the rules should be interpreted rather than the exact letter of the requirements and restrictions which are described. With this point of view understood there is no reason for Mr. Potter to fear the lack of elasticity in the logical development of our present systems of publication.

Yours very truly,

H. Sherman
Chairman, Editorial Committee.

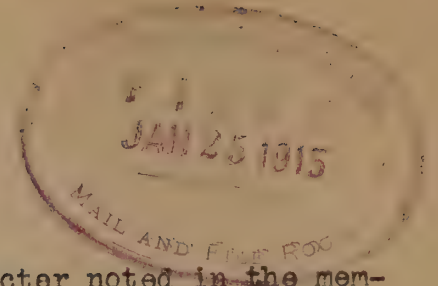


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Greathouse

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Memoranda for Assistant Secretary:

A Farmers' Bulletin series of the general character noted in the memorandum proposed by Dr. Kellerman, should be maintained. A monograph on each important subject of farm operations and farm economy should have place in this series. The list should be made up originally by some authority fully competent to determine what subjects should be included. The numbers should be revised as frequently as new results may warrant.

Two series of numbers should be used to designate all publications of the Department other than Farmers' Bulletins. One should include all books of permanent value, to be called Bulletins; the other, all leaflets and occasional publications, to be called Circulars. The numbers are merely for convenience in handling the publications within the Department; a means for by which the Department clerk can find the publication quickly and inerrantly. Librarians and bibliographers will take care of classification and grouping without reference to these numbers.

All publications of permanent value, which includes Farmers' Bulletins, should have full title pages or covers.

Publications in the same general field, as Chemistry, should be bound together by the Department and supplied free to libraries, at cost to individuals.

Two sets of all publications should be preserved permanently by the Division of Publications as now and indexed for the card index as now. The card index should be made well-known to all branches of the Department and its use much more general. All inquiries for publications by subject should be answered, in general, only after consulting it to determine what the Department has on the subject of inquiry. This was the general policy, as adopted by the Division of Publications, until July 1913

Farmers are by far the most important class to be reached with Department publications. To reach them most effectively the publications should be sought, not sent unasked. Farmers' Bulletins, the publications especially likely to be useful to farmers, should be put before ~~them~~ in brief attractive notices in farm and county papers.

Libraries of Farmers' Bulletins should be put in every country post office and every country school under the care of some competent person and the presence and subjects of the books well advertised in all practicable ways. When a Farmers' Bulletin on an important subject has not been published its place in the library should be supplied by a book privately published until the Farmers' Bulletin can be printed.

Department field agents in demonstration and other work, State field agents, and County Farm Advisers should direct farmers to use the libraries and to get from the Department and keep in their homes the Farmers' Bulletins on subjects of interest, Reports on Diseases of Horses, etc. They should also encourage farmers to subscribe for papers ^{in which} where they can find United States, State, and County announcements. The closest possible relations between the three government agencies named should be maintained, with very great weight given the local agency.

Inquiries from farmers for specific information on a definite subject should be encouraged and printed information secured by use of the card index of Department publications should be supplied, if it can be done economically; if not, a letter should be written from a competent source giving the desired help.



A brief review from memory, not carefully verified, of the development of the publication work of the Department may prove useful in considering publication problems.

Publication work from the foundation of the Department in 1862 to 1889 when Geo. Wm Hill was appointed Chief of Records by Secretary Rusk was in the hands of the Secretary and Assistant Secretary in later years with the aid of J. R. Dodge, Chief of the Bureau of Statistics. In fact, toward the close of the period the preparation and issue of publications was largely placed in the hands of Mr. Dodge and his bureau almost alone had an appropriation from which printing of books could be paid for.

Secretary Rusk wished to secure harmonious expression of views and to regulate the work so that no conflicting expressions would go out from the several branches of the Department and nothing would be published which would embarrass the Secretary. Accordingly he placed the supervision of all publications in Mr. Hill's hand, and soon gave him the title of Editor. Later the distribution of publications was put under Mr. Hill's control.

As the work developed, each integral branch of the Department came to have a series of bulletins and a series of circulars, and there arose besides several series as North American Fauna, Secretary's Reports, etc. The Farmers' Bulletins, a most important, independent series, was established at the same time.

A few years later Mr. Hill proposed that no publications be

sent out to individuals except on application and that the cost of mechanical production be charged. He proposed to send out monthly a list of all publications issued in the preceding month from which any one interested could send for any book he wanted. The purpose of this was to prevent waste of Department publications by sending them to persons who do not want them. The publication of the monthly list was agreed to, but not the adoption of a paid distribution.

In 1897 the present writer suggested the offer of brief statements of results of scientific study in form to promote practical application to the newspapers and agricultural publications, but for some reason the proposal was rejected.

In 1900 Mr. Hill proposed that beginning with the new year 1901 a single series of numbers be used to designate all Department publications. He held that this would simplify the handling of the books in the Department and would serve the purpose of the librarians and bibliographers to tell when they have under consideration all books published by the Department. This suggestion was not adopted.

In 1899 the writer proposed, see Yearbook 1899, page 512, school district agricultural libraries where the Farmers' Bulletins embodying the latest results in each line should be accessible to each inquiring farmer.

In 1913 several periodicals and all Bureau series were superseded by the present series and periodicals and the examination of manuscript to determine its fitness for publication was put in the hands of a committee instead of the Editor and Chief of the Division of Publications.

The preservation of two sets of the Department publications,

conveniently called the vault sets, was assigned to Mr. Hill about twenty years ago and these were for years kept in a fireproof building but quite inaccessible for use. When that building was torn down they were stored for several years and about six years ago they were transferred to the attic of the new East wing where they are protected from fire, but not from loss by carelessness or dishonesty.

In 1905 in the development of the distribution of Department Publications Mr. Hill established the Index Section for the purpose of keeping an indexed record of all important statements found in the Department publications and of supplying books to persons who ask for information by subject. For the latter purpose a series of index cards referring to the important passages, articles, and books that are available for distribution has been maintained and until July 1913, letters asking for information by subject rather than known by serial number were referred to the Index Section and then answered. The number of such applications so answered has in some years approached 10,000.

In 1913 for some unexplained reason the reference of such letters to the Index Section was discontinued.



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MEMORANDUM FOR THE ASSISTANT SECRETARY.

JAN 23 1915
MAILING FILE

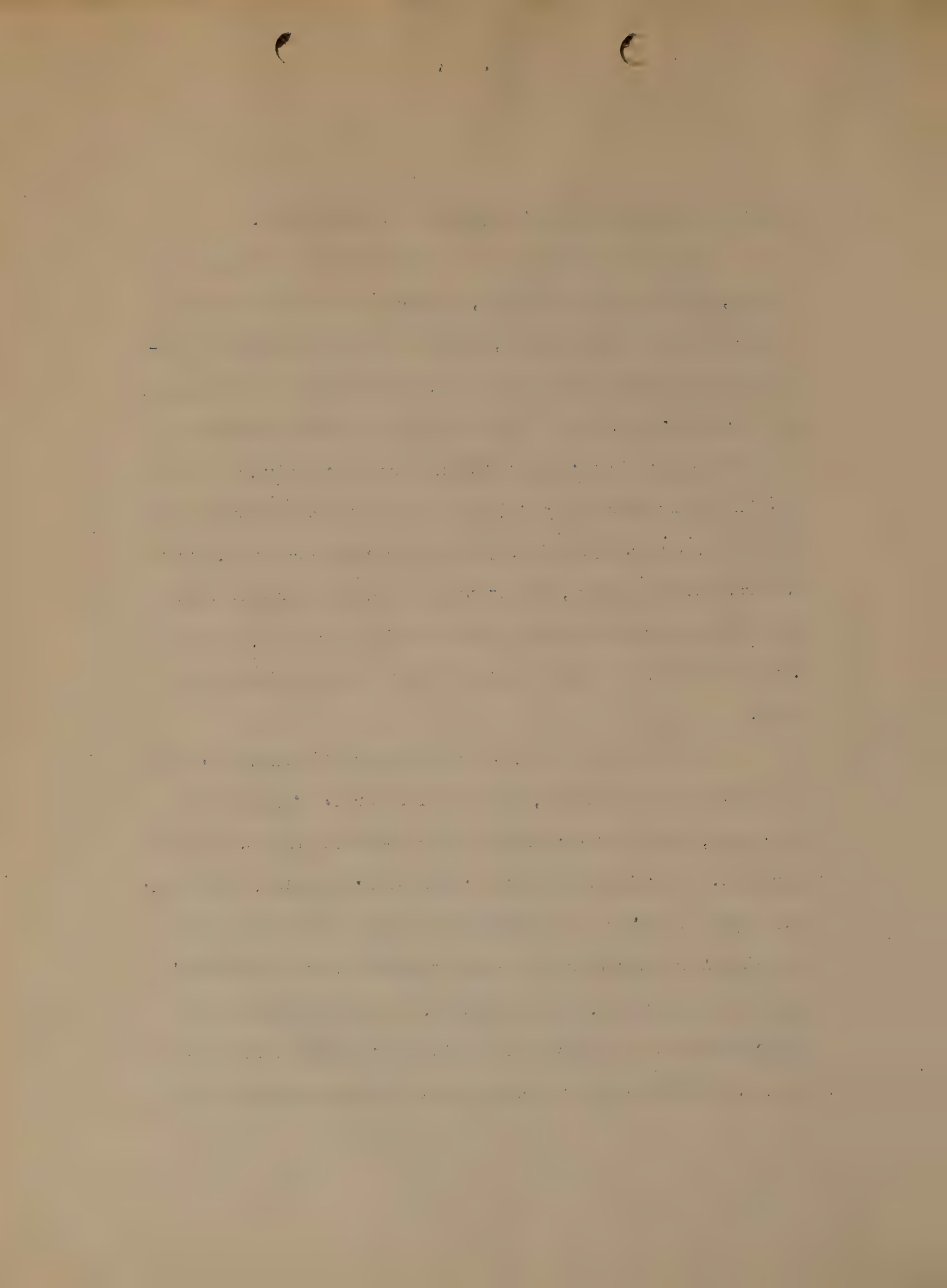
In compliance with the request, conveyed to me verbally by Mr. Greathouse, that I prepare a report on the proposed changes in the publications of the Department as outlined in the manuscripts given to Mr. Greathouse by you, I have the honor to submit:

That the printed matter issued by the Department has for some time been very arbitrarily divided into "publications" and "job work", and that there has been assigned to the latter division much that really complies with the ordinary definition of a publication. The report of the Editor for the past year states that there were 137 numbered Department Bulletins printed, while the total number which should properly be classed as publications aggregated 1152. In addition to the 137 there were included as publications, the Annual Reports of the Department, of the Office of Experiment Stations, of the Bureau of Soils, of the Weather Bureau ~~Survey~~; the Experiment Station Record, the Journal of Agricultural Research, the Weekly News Letter, the Monthly List of Publications, the Monthly Weather Review, the Climatological Bulletin, and Service and Regulatory Announcements; the numbered reports of the Secretary's Office, the North American Fauna, many circulars and the Farmers' Bulletins. But there remain many separates, leaflets, manuals, directories, unnumbered circulars and other administrative circulars not usually classed "job work", which were assigned to no series, and which do not re-

ceive recognition as publications of the Department.

In the effort of July, 1913 to condense all the series, nearly forty in number, to one numbered series which with periodical publications, annual reports and Farmers' Bulletins should cover the whole field of Department publications, the result has been that the order was more often honored in the breach than in the observance; for the restriction as to the class of material that should appear in the numbered series was so narrow that practically at once a new sub-series, known as professional papers, was instituted and an increased number of unnumbered circulars and administrative circulars appeared without location in any series or means of ready identification.

All printed matter of the Department designed to give information to the public, and not of a purely administrative character, should be comprised in the "publications" of the Department. Were it possible to assign every pamphlet, bulletin, and report a number in one definite series, it would doubtless be helpful to librarians and those engaged in the Department's work of distribution; but to do that, all restrictions as to the character of the matter to be included in the series would have to be removed and the number would simply mean that the



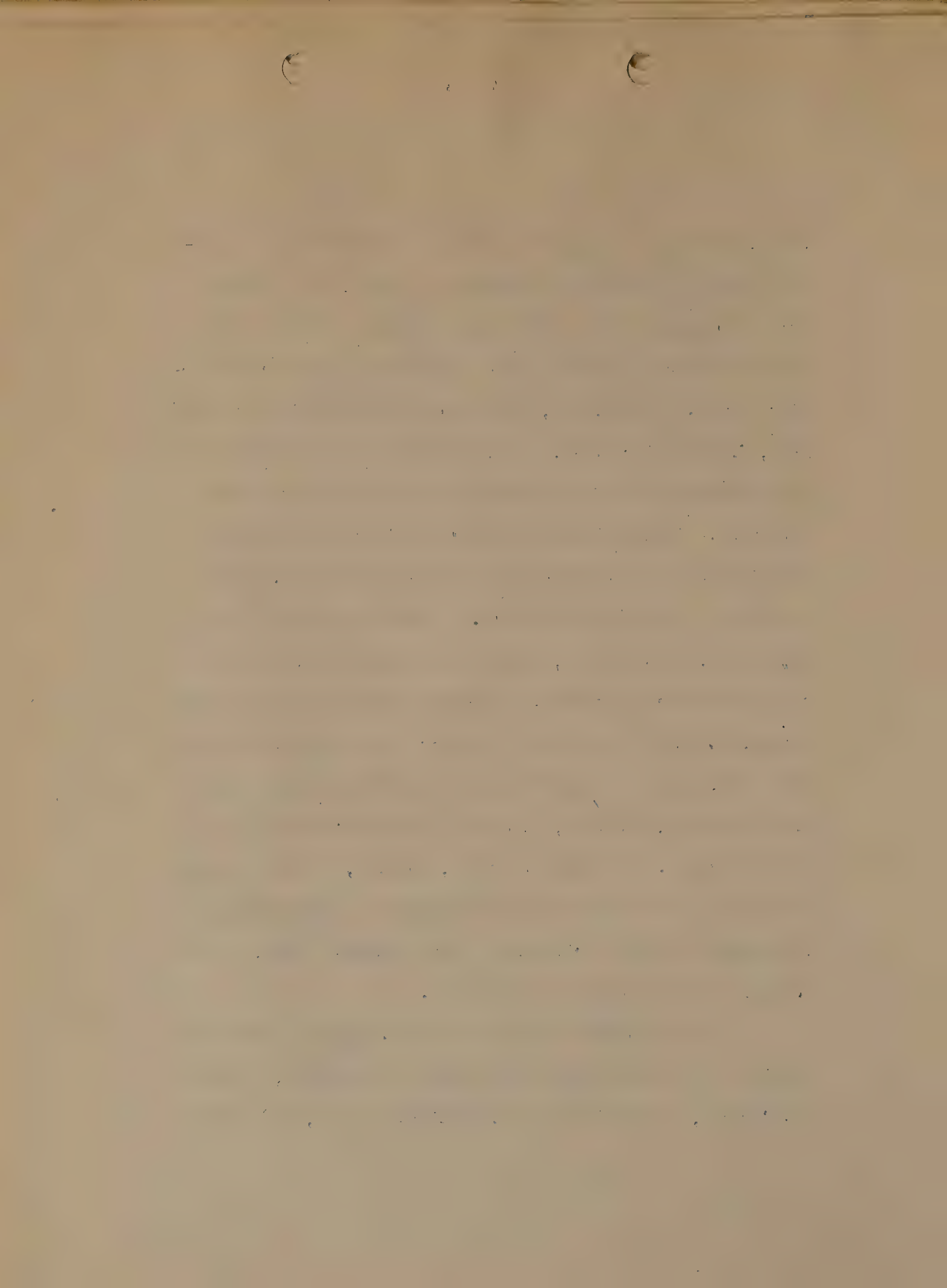
pamphlet, bulletin, or report appeared just after the next lowest and just before the next highest number and would offer no information to the applicant as to its character, the subject, or its application to his needs. It would be a collection of miscellany. On the other hand, if there are to be restrictions as to the matter and style of the existing numbered series of Department Bulletins, then the professional and technical papers should be placed in another series, and a new series should be instituted to contain the circulars, etc.

As it has been found desirable to revive the series of numbered reports of the Secretary's Office, and no difficulty has occurred, it will be equally easy to revive the old series of Secretary's circulars and to assign to it all such as are of general Departmental interest and contain information for the public and are for distribution to the class of applicants who have need of, or may desire, copies; and to revivify the old [^] *material* bureau series of circulars in which each bureau, or office, could number consecutively its orders, instructions, circular letters, etc. which were intended for ⁰¹¹¹²² ~~Departmental~~ use and for distribution only to employees and collaborators in other places.

The public is beginning to ask for information from the Department by subject more frequently than by number of bul-

letin, and when an applicant receives a bulletin on the subject asked for and finds it bearing a number, he is excusable in assuming that all the other bulletins of that series treat of the same subject and in requesting copies of the entire series. In this way, even though the bulletins are not sent, difficulties arise, expense occurs, and the trouble of correspondence and of explanations adds to the work of the employees. Twelve years experience in distributing the publications of the Department developed, in my opinion, no objections to the system of numbering the publications of the Department, as bulletins, reports and circulars of the independent bureaus or offices. Were that the existing system, my opinion would be adverse to a change; but as the change has been made, and the inconvenience and confusion caused by the wrench somewhat overcome, it appears inadvisable to return to the old system. It seems desirable, however, to add at least two series, as above, for the accommodation of publications not complying with the requirements of the present series, or not belonging to any series now published.

The principal consideration in issuing a publication should not be whether it is conveniently classified, properly standardized, or belongs to an established series, but whether



the material it contains is suited to the needs of the farmer and its style and form such as to convey clearly to the reader the idea in the mind of the author. If it is necessarily expressible only in technical terms, then it should be printed in that form for the scientific public. But if it is of a character needed by, and suited to, the requirements of the unscientific, uneducated, and perhaps doubting, tiller of the soil; then it should appear in language, style, and form that would appeal to him, overcome his natural opposition to changing his style of farming, and convince him of the advantages of the new methods, or the truth of the statements.

The form and size of the Department documents should not be unnecessarily restricted. It would be unwise to restrict the publication of bulletins to one size or one style of type, or to insist that the circulars be on letter size paper, or of standard size, or vest pocket size. The documents should be printed in the form, style, and size most suitable for the purpose for which they are intended.

The Department Bulletins and Farmers' Bulletins have for eighteen months been issued in a form that is certainly not conducive to long life, nor do they contain tables of contents, or lists of illustrations to make them of easy reference by those

who may desire to preserve them. Other publications of the Department appear with covers calculated to preserve them, with tables of contents, lists of illustrations, and often with indexes to make them easy of reference by those who receive and care to retain them in their libraries. In this latter class may be mentioned all the publications of the Weather Bureau, which were excepted from any change when the other bureaus of the Department were deprived of their individual publications; the reports of the Insular Experiment Stations and their bulletins; the Soil Surveys, which are separates from the Field Operations of the Bureau of Soils; the Journal of Agricultural Research and its separates, which consist of every article appearing in the Journal, each of which has a cover, even though the text consists of but four pages; the Experiment Station Record, the North American Fauna, and certain other pamphlets. It seems desirable that the major publications of the Department should be issued in such a form as to preserve the outside pages of the text and of such character as to be attractive to the eye as well as instructive to the mind of the applicant. Nor does it appear that the saving in money, though calculated carefully on the basis of the previous year's expense, has been actual, for the year during



which the system has been in force shows an expenditure of \$305,336.06, exclusive of the Weather Bureau and Farmers' Bulletins, and for the previous year \$318,527.33, although only 1056 new publications were issued during last year while 1676 appeared the preceding year. It seems, therefore, that to return to the former method of supplying some form of cover for the larger and more important publications is desirable, even though the circulars and Farmers' Bulletins continue to be issued in their present unattractive and easily mutilated form.

The maintenance of a document room where a file of every publication of the Department, no matter whether a circular letter, printed or mimeographed, or a bound report of the Secretary, should be preserved, has heretofore been attained by the Division of Publications in its two sets of every publication of the Department bound and preserved for further reference. Owing to its cramped quarters and to the inflammable building in which the Division is located, the Division of Publications has never been able to place its file of documents where it could be readily consulted. It may be desirable that the Library be designated as the proper agent for this purpose, and it is assumed that the Library already

possesses a complete file of the Department's publications, so that it will only be necessary for it to extend its services by securing and maintaining a file of the so-called "job work", which, as noted above, contains documents valuable for distribution. It does not seem desirable, however, that the Library should encumber itself with the maintenance of a file of ten copies of each of these publications, nor be authorised to act as a distributing agent. If that many be deposited with the Library there will be a strong temptation to give now and then a copy from its file until the supply is exhausted, and its completeness thereby destroyed. Moreover, there is no difficulty in the Division of Publications depositing in its document room a sufficient number of copies of every piece of printed and flexotyped matter issued by the Department to furnish samples to those who may be called on to prepare similar documents or who desire to know what has been issued on the subject and when it was published.

The establishment of a new serial appears to be unnecessary, as the Weekly News Letter would be a sufficient medium for all Departmental needs, if it contained such matter as was originally proposed for it instead of announcements already furnished to the Press in flexotype form.

Chas. H. H. H.

Cullander



Mr. Carl Vrooman,

Assistant Secretary of Agriculture.

Dear Mr. Vrooman:

I have spend considerable time in getting opinions from the various bureaus concerning Dr. Kellerman's proposed memorandum in regard to publications. The memorandum in question is proposed to supplement Memorandum No. 34, a copy of which is attached.

The principal suggestions made by Dr. Kellerman include:

- (1) The consecutive numbering of all publications including circulars in some one of the series he outlines.
- (2) The establishment of a central file of all publications of whatever kind.

~~XX~~ It seems to be generally agreed that it would be desirable to have a central place at which all of the publications of the Department could be assembled. As a matter of fact, the Division of Publications now maintains such a file of everything which is printed at the Government Printing Office. This would leave only such circulars as are multigraphed or otherwise prepared within the Department. I think the suggestions which have been outlined by Mr. Wharton, in his letter of October 24th, are extremely valuable and, if put into effect, would be much more satisfactory than a rigid plan of procedure as outlined by Dr. Kellerman. Mr. Wharton's suggestions seem to meet with general approval. In this connection, I would also call your attention to memorandum dated October 24th from Mr. Wharton, suggesting

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an additional series of publications in order to take care of material which does not fit in any of the present series. I do not feel prepared to pass on his suggestions, but it would seem worthy of your consideration.

Very truly yours,

WJC
Private Secretary.

Wharton

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C.

OFFICE OF INFORMATION

October 24, 1914.

MEMORANDUM FOR THE ASSISTANT SECRETARY.



My dear Mr. Vrooman:

The suggested project to change the Department's publications seems to be concerned principally with the following propositions:-

1. The concentration of publications into a smaller number of series.
2. The consecutive numbering of all publications, including circulars, in some series.
3. Prescribing standardized forms for different types of publications and circulars.
4. The establishment of a central file of all publications issued.
5. The use of standardized covers on certain publications.

In response to your request, the following opinions as to these different propositions are respectfully submitted:

1. The Concentration of Publications Into a Smaller Number of Series.

The publications of the several Bureaus necessarily cover a wide range of subjects, and the grouping of the papers of all the Bureaus into any single series necessarily is an arbitrary one. The consecutive numbers assigned to these publications represent the order of issue rather than any logical sequence of subject matter. This grouping of widely varied subjects into a numbered series, therefore, is more of a convenience to librarians than to lay readers, who commonly seek their



information by subjects.

Any such series must necessarily be fairly miscellaneous. The more the number of series is restricted, the more miscellaneous must the series become, because of the necessity of finding a place for new material not considered in framing the definition for the series. The more rigid the definition of the series, the more certain it is that difficulty will be found in finding a series place for publications resulting from discovery or from the imposition on the Department of new fields of regulatory, constructive or research work.

Rigidity of definition will make it particularly difficult to classify, with any regular series, circulars designed for special seasonal or geographic use. It will raise similar difficulties in the classification of what might be called the periodical publications, such as the Service and Regulatory Announcements, the Agricultural Outlook, the Weekly News Letter, and similar publications. The Regulatory Announcements are really circulars designed to be of service to a specific class of people, and to attempt to include them in the general series would be to add further to the miscellany of this series.

While it is an excellent thing to limit the number of series and to make it easy for librarians and bibliographers to gather complete files, the Department should always be in a position to issue practically any form of publications which would serve the people, and especially in propaganda should reserve to itself the right to issue that material in a size and form best calculated to achieve the purposes for which it is published.

The primary determination governing the issuance of any circular

or publication should be, not whether it is conveniently classified for the use of librarians, or whether, in size, number of pages, and classification number, it fits into an arbitrarily established series, but whether the material it contains is valuable to the people, and whether the form in which it is to be issued will help the propaganda. At the same time, where orderly numbering does not interfere with its usefulness, librarians, bibliographers, and the occasional collector of complete sets should be given the benefit of this numerical classification.

One of the most popular sets of publications issued by the Department has been the reading courses of the Office of Experiment Stations, which were made up by grouping bulletins from various series into a progressive course. The more the Department can group its material intended for popular use by subjects into an orderly, progressive system of information, the greater will be its benefit to the actual farmer. This could be accomplished by the establishment of sub-series under the major series, without adding in any way to the number of series or instituting any special change in the nature of the series.

To do this, it would simply be necessary to print inconspicuously on the publication a code number based upon the Dewey decimal system of classification of library books by subjects. In the libraries this system brings all books dealing directly with the phases of any given subject into a continuous group on the shelves. If some such system of sub-numbering were used on our bulletins, these sub-numbers would automatically group all material dealing with one special topic, and would sub-group the material under that topic by the special phases discussed. For example, if the code "Ap." were used to indicate "Apples";



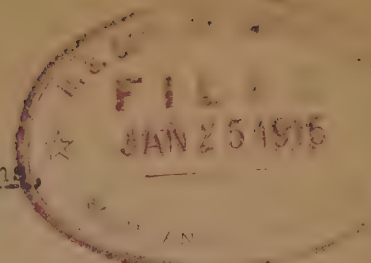
"Cul".to indicate Cultivation; "Dis" to indicate Diseases; "Ins" to indicate Insects; and "Sh" to indicate Shipping, Storing and Transportation, we could have sub-series as follows:

Ap-Cul 1, 2, 3,&c. (Cultivation of apples)
Ap-Dis 1, 2, 3,&c. (Diseases of apples)
Ap-Ins 1, 2, 3,&c. (Insects affecting apples)
Ap-Sh 1, 2, 3,&c. (Shipping, Storing and Transportation)

Doubtless the librarians could work out classifications that would indicate the section of country to which the special apple bulletin might apply. These publications could then be collected by sub-code and title, so as to answer easily a request for all information on apple culture. Also it would serve to bring the bulletins of different Bureaus published in one series into logical sub-groups.

The same system of coding into sub-series could be extended to circulars containing specific information, and also to reprints or originals of scientific papers published with official sanction outside of the Department.

2. The Consecutive Numbering of all Publications,
Including Circulars, in Some Series.



The consecutive numbering, with ordinary titles, of any series of publications, while convenient for librarians, tends to induce people to write for missing numbers. In cases where consecutive numbering is limited to publications on a definite subject, the waste is not so great; but where the numbering encourages people to write in for numbers of a miscellaneous series containing publications on many subjects there necessarily must be a great waste of circulation. If, instead of using ordinary numbers, the Department could devise some code system which would be intelligible to librarians and bibliographers, but not so easily fathomed by lay readers, it would doubtless save a great waste in its publications.

The periodical publications, such as the Agricultural Outlook, the Service and Regulatory Announcements, the Weekly News Letter, and similar issues, might very well bear some volume numbering which would enable those who wished them to know when they had a complete set for a year or a period. For the reasons set forth above, to number these periodical publications which serve distinct purposes and classes as part of any general series, would simply be to add to the miscellaneous character of the series and would serve no purpose except for librarians. Numbering these into one of the miscellaneous series, moreover, would probably be confusing to the people who wished to have complete sets of these publications, but were not specially interested in the other publications of the Department.

Circulars as issued at present are of two classes: (1) Those conveying instructions to the field and other forces, but not containing information to be transmitted to the public; (2) Circulars which, while

directed to the field forces, or published in bulletin size, contain information which the Department's agents are to transmit to farmers and others.

The first class of circulars is really more in the nature of an order, and might very well be known as a Bureau or Office order, or under the title of "Instructions" rather than "Circulars", so as to distinguish the purely executive circulars from the information circulars. The question of numbering the orders is a matter largely to be determined by Bureau or Office convenience, as these orders are really equivalent to typewritten letters, and presumably they should be filed and kept by the Office issuing them. There is no special reason why they should be made part of the information series or numbered in with the other publications.

The second class of circulars, conveying information to agents or others and designed for dissemination to the public, might very well be numbered, though here again the use of ordinary numbering would invite those receiving one circular to write in for the remaining numbers. Some code system indicating the Bureau and the order of issue might very well answer this purpose. Printing the date of issue on them would probably afford sufficient means of identification. It certainly would be very confusing to number these circulars, many of which are intended for seasonal or local use, or for special emergencies, into any of the formal series. If, however, a sub-coding by the Dewey system were used on these circulars, or at least on the supply to be retained in the Department, this would link them at once into their proper places in the sub-series of publications by subjects. If this were done, any one calling for all the Department's published information



on a given subject would readily find this by the general library sub-code for that topic.

Many of the requests for all the back numbers of a series arise from the fact that the recipient of one number thinks the entire series is devoted to the same subject. With the sub-coding system it would be possible to send a person who requested all the remaining numbers, and who did not show that his object was to make a complete set of miscellaneous publications, all the numbers in a series referring to the same general subject. If this sub-series did not satisfy him, he then could request the remaining miscellaneous numbers.

3. Prescribing Standardized Forms for Different Types of Publications and Circulars..

Prescribing that all publications other than the regular series should be a size other than the standard bulletin dimensions would constrict the elasticity and probably seriously lessen the value of many circulars. The purpose of this seems to be to differentiate sharply circular matter from the regular series. If this is important, it can be accomplished by having all circulars printed on light tinted paper. To fix letter size for circulars would be to make very inconvenient certain handbooks and lists which field men have to carry in their pockets. Such circulars are most convenient in small size, which fits readily into the vest or inside coat pocket or into a wallet. Other circulars should be issued probably in poster form for publication on the bulletin boards of post offices. In certain cases, the standard size might be convenient when it became necessary to use some of the plates or cuts from old publications. The size of the circulars should be determined by the purpose for which they are intended. The Department should not commit itself to any arbitrary standard size which might lessen greatly the effect of propaganda. If standardization for convenience in filing were the object, the bulletin size would be most desirable, as the circulars would then fit into files with other publications. Such a size, however, would interfere with the mimeographed circulars which are issued in larger form.

4. The establishment of a Central File of All Publications Issued.

FILE
JAN 25 1915

The proposition to have a central file of all material issued in formal or circular form by the Department is a most valuable one. This would make complete the very valuable central index which covers all formal publications by subjects, and enables the Division of Publications to locate a bulletin if the information sought is mentioned only in a single sentence anywhere in that publication. If circulars are kept,--and many of the circulars contain very practical information of permanent value-- they should be similarly indexed and cross-indexed. Such an index would enable any one seeking for all the material issued by the Department on a given subject to locate at once not merely formal publications, but also all circular utterances bearing on the topic. This index, together with the sub-coding by subject discussed above, would make all circulars of information a part of the general sub-series of the Department.

A copy of every information circular issued by the Department should be sent to the Chief of every Bureau and independent office, just as is done with formal publications. Under the present system, knowledge of the issuance of circulars is largely accidental outside of the special offices issuing them. On this account many of the workers in the Department are unaware of material published informally on topics allied to their own work, and this might very well lead to conflict in circular material. It would seem expedient to appoint a committee, or, preferably, one editor, to read all material designed for circulars so as to make certain that there is no duplication or conflict between Bureaus and Offices. He could also see to it that the writers of circulars

took into consideration any previous utterances by their own or other offices on the subject.

Similarly, all reprints or originals of scientific papers published with the sanction of the Department in outside journals should be kept and indexed, and by a sub-series code made part of the complete information on the special subject.

5. The Use of Standardized Covers on Certain Publications.

Anything that will add to the appearance and contribute to the life of the Department's publications is highly desirable. A strong, attractive cover would do much to insure the publications a permanent place on private shelves, and also add much to the life of such numbers as are given circulation in the public libraries. It is a question, however, whether a single color or type of cover should be prescribed for all Department publications. In certain cases, and especially bulletins issued with the idea of interesting children in some phase of agriculture, an attractive illustrated cover in colors would undoubtedly increase the educational effect of such publications.

Respectfully submitted,

G. W. Lister

Chief.

Wharton

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C.

OFFICE OF INFORMATION

October 24, 1914

JAN 25 1915

MEMORANDUM FOR THE SECRETARY.

Sir:

Under the present system, the Department has no publication designed accurately to keep the large field force apprised of current scientific publications and discoveries. The professional Departmental bulletins, which contain much material that would be valuable to these field workers, are issued in limited editions and the greater part of these limited editions is consumed in supplying experiment stations, libraries, and selected scientific exchange lists. Comparatively few copies remain and it is impossible to send them to all field workers and collaborating agents.

Similarly, there is no direct way of placing the facts of scientific discovery and report quickly and economically in the hands of the students of the several agricultural colleges. The Experiment Station Record reports briefly, in a highly technical way, on the publications of the Department, the experiment stations and colleges, scientific societies, and foreign scientific bodies. This record, however, is of limited circulation and is somewhat too technical and condensed in material to be fully informing to the field force and students in agricultural colleges. The Journal of Agricultural Research is highly technical, and, of course, is not available for any wide circulation.

Moreover, the Department has no publication designed to give extensive but accurately directed circulation to the results of the many important public conferences which yearly take place in the Department.

At these conferences, many valuable papers containing information of permanent value are read, and many agreements looking to cooperative action are ratified. Under the present system, the results of these conferences do not appear for a number of months, and then only in proceedings the circulation of which is limited to the actual membership. As a result, much of this material which would be of general value never reaches those who do not actually participate in the discussions.

Again, many of the Department's representatives speak in an official capacity at conventions or special meetings. Not infrequently their addresses contain material of great practical value, and, in some instances, very important for propaganda or special circulation. Under the present system, the public delivery of an address is liable to bar its appearance as a formal publication, and the authors to secure its circulation are forced to give it to some outside trade or technical magazine.

A periodical, official summary, or circular, similar in size to the News Letter, occupying a field of information between the popularly written articles of the News Letter and the scientific papers and summaries of the Journal of Agricultural Research and the Experiment Station Record would give an outlet to much material now buried for lack of a proper medium and, in my opinion, would be of great educational service and do much to promote esprit de corps in the Department's field force. It also should be of great educational service to students in agricultural colleges and tend to promote cooperation between the State Colleges and the Department.

The following are rough suggestions as to the character of material, and makeup and circulation of the proposed publication:

1. Character of Material.

The purpose of the official summary would be to supply scientific

information and direction to the man with more scientific training and understanding than the average layman, but possibly with smaller scientific attainment than the specializing expert. For this reason, the summaries or reviews should be somewhat simpler than the regular reviews of scientific material published in scientific journals and in the Experiment Station Record. The most practicable standard probably would be the kind of material that a professor in an agricultural college would give to his second-year students. This would involve some definition of uncommon scientific terms.

This material should cover, among other phases of the work, the following:

(a) A careful summary of all professional papers, bulletins, and circulars, in such a way that the reader would fully understand the purpose of the paper and its applicability to his special line of work or study. This would tend to limit applications for the actual publications to those who really needed them in their work. Where the professional paper reviewed contains practical directions for the application of a method, these directions should be carefully included in workable form in the review.

(b) Careful summaries of circulars and other propaganda containing information of general or permanent interest.

(c) Specially prepared scientific directions or suggestions covering seasonal or emergency operations.

(d) Careful summaries of public or other general conferences, and careful reviews or digests of papers delivered at these conferences, and also ^{of} addresses containing valuable information delivered in an official capacity by the Department's representatives at conventions or special gatherings.

(e) Any statements of the actual beginning of research which the bureaus might care to communicate, in order to avoid duplication of effort or encourage cooperation.

(f) Such directions for general cooperation as the Department might find it expedient to issue from time to time.

(g) Selections for reprint, possibly slightly rewritten, from the Experiment Station Review.

(h) Occasional summaries of the more important and practical State agricultural publications.

(i) Summaries of scientific papers, the publication of which in outside journals has been authorized.

(j) Any other semitechnical material for which the Department wishes to secure general scientific circulation more quickly than is possible through the formal publications.

The work would call for the services of a man of scientific attainments, with ability as a writer and educator, and with experience in propaganda.

2. Makeup and Circulation.

The publication could be issued most conveniently and economically in the size of the News Letter. Somewhat better paper possibly should be used in occasional numbers where half-tone cuts are needed. The number of pages should vary according to the amount of material available. The publication should be issued monthly, with the privilege of issuing supplements where the material demands immediate circulation.

The publication should be sent to the entire scientific and demonstration staffs of the Department, to cooperators, to the faculties and students of State Colleges, to experiment stations, and to a select list of scientific and technical publications. This would involve an issue of about 25,000 copies.

The general purpose would be to make this a fairly complete monthly review of scientific accomplishment and activities of the Department, and it would be sent only to those who naturally would be interested in this work.

Respectfully,

G. W. Wharton

Chief.

Abst. Clerk

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the Secretary's File Room

DEPARTMENT OF AGRICULTURE
WASHINGTON

February 15, 1915.

Labors (Memorandum No. 119.)

Forbidding certain officers and employees of the Department of Agriculture to speculate in cotton and improperly to disclose confidential information secured in connection with the administration of the United States Cotton Futures Act.

--oOo--

In view of the fact that the Department of Agriculture in administering the United States Cotton Futures Act of August 18, 1914 (38 Stat., 693), will secure information of a confidential character of possible value for speculating in cotton, much of which will frequently be given upon the promise of the Department that the individual or collective transactions of the person concerned will not be made public in such way or at such time as will disclose any facts that may injure his business or give a business advantage to his competitors, it is thought desirable at the outset to safe-guard the information against improper use. The following order is therefore issued, effective this day:

All officers and employees of the Office of Markets and Rural Organization, and all other officers and employees of the

Department of Agriculture who may be connected in any way with the administration of the Act, are forbidden, either directly or indirectly,

1. To deal in, or to have or acquire any interest in, any contract for the purchase or sale of cotton for future delivery;

2. To deal in, or to have or acquire any interest in, any spot cotton, without the previous written consent of the Secretary of Agriculture, secured upon application submitted through the Chief of the bureau, office or division in which the applicant is employed; and

3. To use for other than official purposes, or to disclose, or to authorize, aid, or assist in disclosing, to any person or persons, other than officers or employees of the Department authorized to receive the same in the line of their duties, any confidential information voluntarily furnished to the Department, in the course of the administration of the Act, except that such information may be given out to the public, by authorized officers of the Department, for such purposes, to such extent, in such manner, and at such times as may not be at variance with the terms upon which the same was furnished.

This memorandum shall not be deemed, or construed to impose, any limitation upon the exercise of the authority of the Secretary of Agriculture "to publish from time to time the results of investigations made in pursuance of" the Act, as directed by Section 20 thereof.

D. S. Houston,
Secretary.



DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C.

PLEASE RETURN TO THE
February 17, 1915.

SECRETARY'S FILE ROOM.

MEMORANDUM NO. 130.

Announcing the Establishment of a Departmental Edition of the
Weekly News Letter.

To Chiefs of Bureaus and Independent Offices:

To meet the need of a publication which will serve as a clearing-house of information for the entire personnel of the department and the collaborating and cooperating agencies, it is proposed to publish periodically a Departmental Edition of the Weekly News Letter. The purposes for which the Departmental Edition will be issued are in general as follows:

To afford a convenient method: (a) for outlining Departmental policies and interpreting new legislation and orders; (b) announcing projects and changes in projects, and outlining opportunities for co-operation in general projects; (c) publishing notices and reports of hearings, meetings, conferences, etc.; (d) making accessible for Departmental use certain material hitherto published only in outside publications and not obtainable in answering correspondence; (e) issuing material designed to promote esprit de corps and to give each member of the personnel more complete knowledge of the general activities of the department.

The proposed Departmental Edition will be merely a monthly enlargement of the regular Weekly News Letter and will not interfere with the present series of publications nor conflict in any way with

the issuance by bureaus of circulars, orders, notices, announcements, or other material. Bureaus wishing to make brief general announcements can, at will, avail themselves of the columns of the Departmental Edition as a convenient substitute for issuing circulars in large editions. This Departmental Edition, which will be published at the close of each business month, will be in charge of the Office of Information. In cases of emergency, special supplements can be issued to give rapid and general communication of special advice or instruction. The Departmental Edition will be the same in page size, paper, and typography as the regular issues of the Weekly News Letter.

The Departmental Edition will be sent to employees of the department, to collaborating agencies, and to a limited list of others who clearly can make good use of an official publication of this character.

In general, material for publication will be prepared by the several bureaus and offices, and all material dealing with the activities of a bureau will be approved by that bureau and the Secretary or Assistant Secretary before insertion. In editorial policy the Departmental Edition will follow a middle course between the highly technical papers and technical reviews of the Journal of Agricultural Research and the Experiment Station Record, and the purely popular material of the Weekly News Letter. In general its reviews and summaries of professional papers and addresses will be of a standard readily intelligible to second-year students in Agricultural colleges. In these reviews emphasis will be laid upon practical or definite suggestions in

the papers under consideration. Material designed for popular application, including summaries or reviews of Farmers' Bulletins, will be published in the Weekly News Letter and will not be repeated in the Departmental Edition. To make this popular material accessible also to the personnel, the Office of Information will send the Crop Correspondents' edition of the Weekly News Letter to all who receive the Departmental Edition.

The following committee has been appointed to develop this project:

Raymond Evans, Office of the Assistant Secretary, Chairman,
J. M. Pickens, Editor, Bureau of Animal Industry,
Herbert A. Smith, Editor, Forest Service,
G. W. Wharton, Office of Information.

Effort will be made to issue the first or experimental number of the Departmental Edition for the month of March, 1915. To this end the Assistant Secretary and the committee will confer with representatives of the several bureaus and offices at 10 A. M., Wednesday, March 3 in the Office of the Assistant Secretary.

Each chief of bureau or office is requested to designate to the Assistant Secretary, not later than 12 M. Monday, March 1, an editorial representative (or representatives) to cooperate with the committee and to be responsible for the preparation and approval of material covering his branch of the service.

Each chief of bureau and office is further requested to issue instructions that copies of all general circulars or orders issued under his direction are sent promptly as issued to G. W. Wharton, Chief, Office of Information, for consideration as material for the Departmental

Edition. It is desired also that notice be given as far in advance as possible, of all conferences or hearings at which general attendance is desirable or in which material which would be of general interest to the department might be developed. This is in furtherance of the desire to make the Departmental Edition a complete and interesting monthly record of the major activities of the department.

Carl Vrooman

Acting Secretary.

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON

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The Secretary's File Room

February 11, 1914.

MEMORANDUM NO. 120 A

Policy of the Department regarding Prizes in the
Boys' and Girls' Club Contests.

For several years past the winners of state prizes in the Boys' and Girls' Club Contests in a number of states have been encouraged by the Department to assemble in Washington after the close of the crop season. These trips to Washington have afforded the prize winners the interesting and useful experience of travel and they have also been made an occasion for the presentation of diplomas by the Secretary of Agriculture, in recognition of the proved efficiency of the prize winners in the particular field in which they have excelled. The trips to Washington have been of the nature of additional rewards to the winners in the state contests, and though suggested by the Department have been entirely financed by state or local agencies. They have undoubtedly served a very useful purpose by concentrating the attention of large numbers of young people upon the possibilities of farming by modern methods, and by emphasizing the dignity and desirability of agriculture as a calling.

The Boys' and Girls' Club movement has now attained such magni-

tude and momentum that it appears advisable to those interested in its continued and increasing usefulness that the rewards for achievement in these contests be made more permanently useful and helpful to the winners, by encouraging and aiding the steady educational development of the recipients. It is accordingly suggested by the Department to those who are cooperating in this work in the states that the chief prizes for club work hereafter be of such character as to permit and encourage attendance upon agricultural courses in the respective states, rather than through the offering of cash prizes or of extended travel trips. The chief prize for a county might very appropriately be the expense of attendance upon one of the short courses at the state agricultural college. A suitable chief prize for a state competition would be the expenses and tuition of the winner for one year at the agricultural college or some similar institution. In this way the rewards offered would be of a very substantial and continuingly useful character, stimulating the winners to continue a systematic educational development along the lines that they may individually prefer.

A beginning along this line has already been made in some of the states and has been found to work well in practice. It will accordingly be the future policy of the Department to encourage the adoption of this general plan in lieu of the annual trips to Washington that have been made in recent years. Correspondence is being conducted with cooperating agencies working with the Department in each of the states as to how this change of policy may best be adapted to the conditions in these states.

W. E. C.
Acting Secretary.

Appt. Clerk

DEPARTMENT OF AGRICULTURE
WASHINGTON

March 10, 1915

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MEMORANDUM

121
No. 121

Regarding Reorganization of the Work of the Department of
Agriculture.

In the Agricultural Appropriation Act for the current fiscal year, the Secretary of Agriculture was authorized and directed to prepare a plan for reorganizing, redirecting, and systematizing the work of the Department of Agriculture as the interests of economical and efficient administration may require, and to submit such plan in the Book of Estimates for the fiscal year 1916. In accordance with this direction, a proposed plan of reorganization was submitted in the estimates and has been approved by the Congress, having been included in the Agricultural Appropriation Act for the fiscal year 1916, approved March 4, 1915. The plan involves the following changes:

1. Specific provision is made for the Office of Markets and Rural Organization by that name.
2. The Office of Farm Management, including the "logged off" land investigations, becomes a unit of the Office of the Secretary. The investigations of the utilization of cacti and other dry-land plants, and of the most effective methods of eradicating weeds, now conducted by the Office of Farm Management, remain in the Bureau of Plant Industry. The following lines of work, now carried on by the Of-

fice of Farm Management, are transferred as indicated: The farm architectural work to the Office of Public Roads and Rural Engineering; the farm home management work to the States Relations Service; and the farm credit and farm insurance investigations to the Office of Markets and Rural Organization.

3. Studies of the biology of insects parasitic to animals are to be conducted by the Bureau of Entomology.
4. The cotton standardization work, with the exception of certain technological investigations, is transferred from the Bureau of Plant Industry to the Office of Markets and Rural Organization.
5. The name of the Office of Experiment Stations is changed to the States Relations Service. The farm demonstration work in the Northern and Western States and in the Southern States, and the farm home management work now conducted by the Office of Farm Management, are transferred from the Bureau of Plant Industry to this Service. The title "Nutrition Investigations" is omitted from the item for investigating the relative utility and economy of agricultural products for food, clothing, and other uses in the home, but the language of the item itself is unchanged. Additional language, however, is included in the appropriation for the Bureau of Chemistry to authorize that Bureau to conduct investigations of the physiological effects of foods upon the human organism which are now carried on by the Office of Experiment Stations under the item "Nutrition Investigations." The work of the States Relations Service under this item, with the title eliminated, will be redirected and limited to home economics investigations, including investigations on foods, clothing, and household equipment and management.
6. The name of the Office of Public Roads is changed to the Office of Public Roads and Rural Engineering. The irrigation and drainage investigations now carried on by the Office of Experiment Stations, and the farm architectural work now conducted by the Office of Farm Management, are transferred to that office.
7. The poisonous plant investigations, so far as they relate to the effect of such plants on animals, are transferred from the Bureau of Plant Industry to the Bureau of Animal Industry.

8. The soil fertility investigations now conducted by the Bureau of Soils are transferred to the Bureau of Plant Industry.
9. The farm credit and farm insurance investigations now conducted under the Office of Farm Management, and the investigations now carried on by the Dairy Division of the Bureau of Animal Industry regarding the marketing of milk, are transferred to the Office of Markets and Rural Organization.
10. The wood distillation work now conducted by the Bureau of Chemistry is transferred to the Forest Service.
11. Additional language is included in the item for poultry and egg investigations in the Bureau of Chemistry to provide that such investigations shall be carried on in cooperation with the Bureau of Animal Industry and the Office of Markets and Rural Organization.

Accordingly, it is hereby ordered that these changes be carried into effect on July 1, 1915. Each chief of bureau or office concerned is requested to proceed immediately to make the necessary adjustments so that they can actually be accomplished on that date with the minimum amount of hindrance or delay to the lines of work involved. In the meantime, however, it is important, and it is so ordered, that the chief of the bureau or office to which a line of work is to be transferred should be kept fully advised regarding the progress of the work and freely consulted with reference to all matters connected therewith, excepting those of a purely routine character. It is particularly important that no new projects should be undertaken or any pending projects discontinued, or any important changes in the personnel made, without the approval of the chief of the bureau or office to which the work is to be transferred.

In addition to the plan of reorganization submitted in the estimates, it was decided, after careful and thorough consideration, that greater efficiency would result by definitely outlining or segregating within each bureau the three main groups of activities of the Department, namely, the regulatory, the research, and the extension - that is, the regulatory functions should be so segregated or outlined as not to interfere with the research work, or either of these with the educational or extension work, but, on the other hand, they should be so organized and related that each will reenforce and foster the other. In order to accomplish this purpose, each chief of bureau, division, independent office, or board should give the matter prompt and careful consideration with a view to formulating a definite plan for segregating the regulatory, the research, and the extension work under his supervision in the manner suggested. This plan, accompanied by a chart showing in graphic form the proposed segregation, should be submitted to the Secretary not later than ^{May}~~June~~ 1, 1915, in order that it may be carefully considered by him, and, if approved, put into effect when the other changes referred to above are made.

K. V. Smith

Secretary.

Noted

F

DEPARTMENT OF AGRICULTURE
WASHINGTON

March 16, 1915.

MEMORANDUM NO. 122.

Regarding delay in return of manuscripts and proofs
to the Division of Publications.

The failure of chiefs of bureaus, divisions and offices to promptly return the manuscripts or proofs of documents referred to them by the Department editor for examination has resulted in many instances in serious delay in the issuance of the documents. It is important, of course, that information regarding the work of the Department should be made available to the public as promptly as possible and that all delays should be reduced to the minimum. It is ordered, therefore, that immediate consideration be given by chiefs of bureaus, divisions and offices to all manuscripts or proofs referred to them for examination and that the same be returned to the Division of Publications WITHIN THREE DAYS, with such recommendations or criticisms as they may desire to make.

J. H. Johnston
Secretary.

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March 16, 1915.

MEMORANDUM NO. 122.

Regarding delay in return of manuscripts and proofs
to the Division of Publications.

The failure of chiefs of bureaus, divisions and offices to promptly ^{to} return the manuscripts or proofs of documents referred to them by the Department editor for examination has resulted in many instances in serious delay in the issuance of the documents. It is important, of course, that information regarding the work of the Department should be made available to the public as promptly as possible and that all delays should be reduced to the minimum. It is ordered, therefore, that immediate consideration be given by chiefs of bureaus, divisions and offices to all manuscripts or proofs referred to them for examination and that the same be returned to the Division of Publications WITHIN THREE DAYS, with such recommendations or criticisms as they may desire to make.

D. A. Houston

Secretary.

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U.S. DEPT. OF AGRICULTURE
WASHINGTON, D.C.

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The Bureau of Entomology and Plant Quarantine, U.S. Department of Agriculture, has the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the matter of the importation of plants from Mexico. The Bureau is at present engaged in the preparation of a report on the subject of the importation of plants from Mexico, and it is hoped that the report will be ready for publication in the near future. In the meantime, the Bureau is unable to give you any definite answer to your inquiry. It is, however, the policy of the Department to encourage the importation of plants from Mexico, and it is hoped that the report will be of assistance to you in this regard.

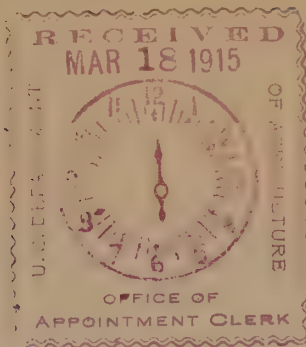
Very respectfully,
J. H. Henshaw

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Manuscripts referred to B. P. I. and not returned

March 15, 1915.

Title of Manuscript.	Publication Series.	Contributing Bureau.	Date referred to B.P.I.
The Round-Head- ed Apple-Tree Borer.	Dept. Bul.	Entomology.	Jan. 23, 1915.
Studies on Fruit Juices.	Dept. Bul.	Chemistry.	March 1, 1915.
Irrigation Prac- tice in Rice growing.	F. B.	O.E.S.	March 3, 1915.
Katydid Injur- ious to Or- anges in Cal.	Dept. Bul.	Entomology.	March 4, 1915.
Utilization and Management of Lodgepole Pine in the Rocky Moun- tains.	Dept. Bul.	For. Ser.	March 9, 1915.
The Control of the Citrus Thrips.	Dept. Bul.	Entomology	March 10, 1915.
Cotton Ware- houses: Stor- age Facili- ties now Avail- able in the South.	Dept. Bul.	Markets & Rural Organi- zation.	March 10, 1915. (Second Reference)
Farmers' Insti- tute and Agri- cultural Ex- tension Work in in 1914.	Far. Bul.	O.E.S.	March 13, 1915.



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March 16, 1915.

MEMORANDUM NO. 123.

Extracts from appropriation acts for 1916 (other than the Agricultural Appropriation Act) which relate either directly or indirectly to the Department of Agriculture.

The attention of administrative officials of the Department is invited to the following provisions of a general nature which are included in the several appropriation acts indicated:

Sundry Civil Appropriation Act, approved March 3, 1915 (Public No. 263).

Page 12 (Under the caption Public Buildings, Operating Expenses):

"Furniture and repairs of furniture: * * * * *

All furniture now owned by the United States in other public buildings and in buildings rented by the United States shall be used, so far as practicable, whether it corresponds with the present regulation plan for furniture or not."

Pages 67 and 68 (Under the caption Government Printing Office, Public Printing and Binding):

"For the Department of Agriculture, including not to exceed \$47,000 for the Weather Bureau, and including the Annual Report of the Secretary of Agriculture, as required by the Act approved January twelfth, eighteen hundred and ninety-five, and in pursuance of the joint resolution Numbered Thirteen, approved March thirtieth, nineteen hundred and six, and also including not to exceed \$137,500 for farmers' bulletins, which shall be adapted to the interests of the people of the different sections of the country, an equal proportion of four-fifths of which shall be delivered to or sent out under the addressed franks furnished by Senators, Representatives, and Delegates in Congress, as they shall direct, \$500,000."

"That no more than an allotment of one-half of the sum hereby appropriated for the public printing and for the public binding shall be expended in the first two quarters of the fiscal year, and no more than one-fourth thereof may be expended in either of the last two quarters of the fiscal year, except that, in addition thereto, in either of said last quarters the unexpended balances of allotments for preceding quarters may be expended; and no department or Government establishment shall consume in any such period a greater percentage of its allotment than can be lawfully expended during the same period of the whole appropriation."

"Money appropriated under the foregoing allotments shall not be expended for printing or binding for any of the executive departments or other Government establishments except such as shall be certified in writing to the Public Printer by the respective heads or chiefs thereof to be necessary to conduct the ordinary and routine business required by law of such executive departments or Government establishments, and except such reports, monographs, bulletins, or other publications as are authorized by law or specifically provided for in appropriations herein; all other printing required or deemed necessary or desirable by heads of executive departments or other Government establishments or offices or bureaus thereof shall be done only as Congress shall from time to time authorize."

"No part of any money appropriated in this Act shall be paid to any person employed in the Government Printing Office while detailed for or performing service in any other executive branch of the public service of the United States unless such detail be authorized by law."

Page 73 (Under Miscellaneous provisions):

"Sec. 4. That appropriations herein for printing and binding shall not be used for any annual report or the accompanying documents unless the copy therefor is furnished to the Public Printer in the following manner: Copies of the documents accompanying such annual reports on or before the fifteenth day of October of each year; copies of the annual reports on or before the fifteenth day of November of each year; and complete revised proofs of the accompanying documents and the annual reports on the tenth and twentieth days of November of each year, respectively. The provisions of this section shall not apply to the annual reports of the Smithsonian Institution, the Commissioner of Patents, or the Comptroller of the Currency."

Legislative, Executive, and Judicial Appropriation Act, approved March 4, 1915
Page 13 (Under the caption Civil Service Commission): (Public No. 290).

"For establishment and maintenance of system of efficiency ratings, pursuant to section four of the legislative, executive, and judicial appropriation Act for the fiscal year nineteen hundred and thirteen, for investigation of the needs of the several executive departments and



independent establishments with respect to personnel; and for investigation of duplication of statistical and other work and methods of business in the various branches of the Government service; including not more than \$2,500 for equipment, supplies, stationery, books, and printing; and not more than \$50 for street car fare, \$30,000; the chief of the Division of Efficiency herein provided for shall be appointed by the President and shall report to Congress at the beginning of each regular session, through the President, the nature and progress of work undertaken by the division together with a detailed statement of expenditures showing the persons employed, their duties, and the compensation paid to each: Provided, That no person shall be employed hereunder at a compensation in excess of \$4,000 per annum."

Page 54 (Under the caption Bureau of Standards):

"For testing miscellaneous materials, including supplies for the Government Departments and independent establishments, including personal services in the District of Columbia and in the field, as authorized by law, \$20,000."

Pages 59 and 60 (Under Miscellaneous provisions):

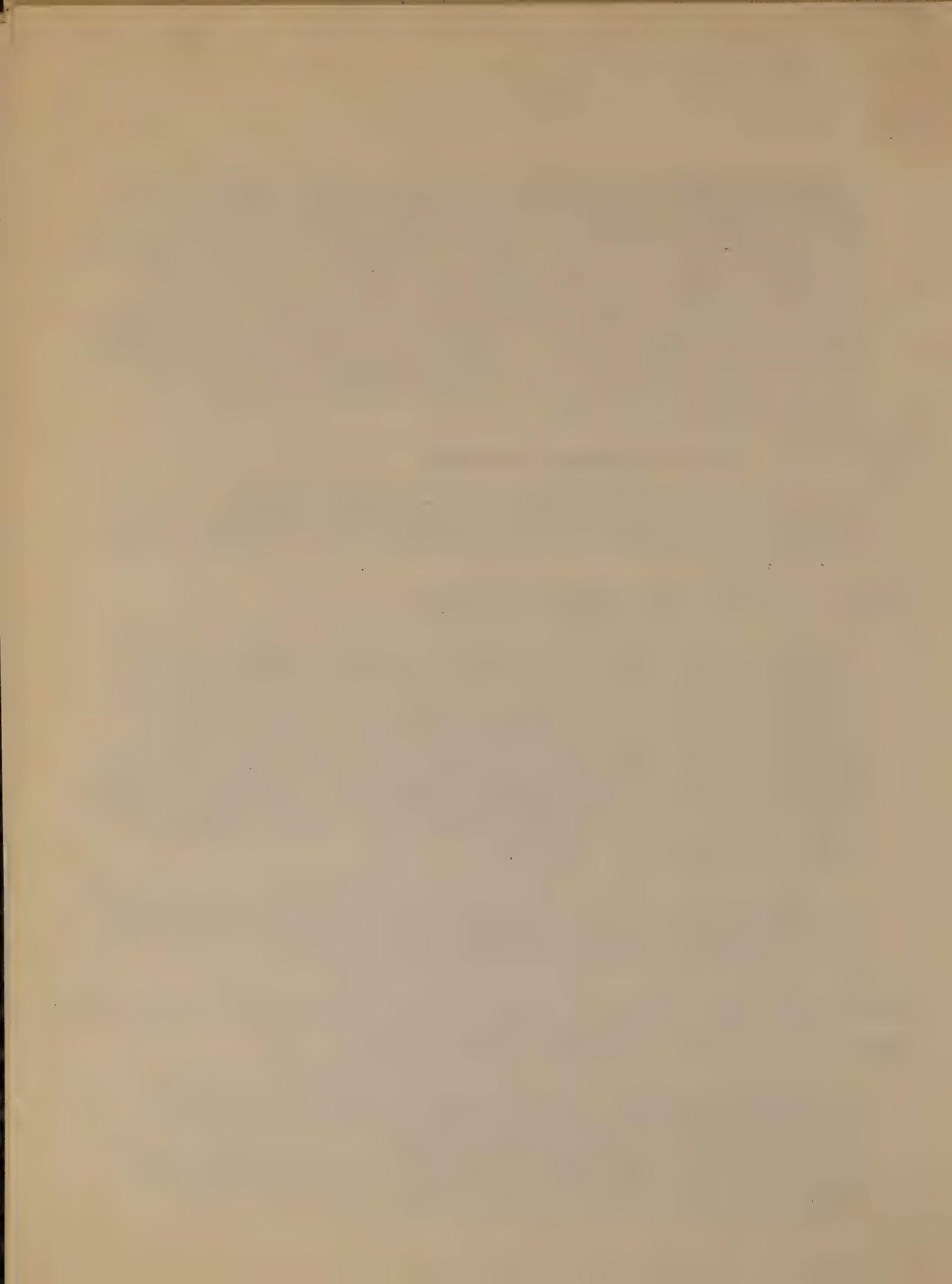
"Sec. 4. That no part of any money appropriated by this Act shall be used during the fiscal year nineteen hundred and sixteen for the purchase of any typewriting machine at a price in excess of the lowest price paid by the Government of the United States for the same make and model of machine during the period of the fiscal years nineteen hundred and thirteen and nineteen hundred and fourteen; such price shall include the value of any typewriting machine or machines given in exchange, but shall not apply to special prices granted on typewriting machines used in schools of the District of Columbia or of the Indian Service, the lowest of which special prices paid for typewriting machines shall not be exceeded in future purchases for such schools."

"Sec. 5. That hereafter subscriptions to periodicals, which have been certified in writing by the respective heads of the executive departments or other Government establishments to be required for official use, may be paid in advance from appropriations available therefor."

Diplomatic and Consular Appropriation Act, approved March 4, 1915 (Public No. 294).

Page 13 (Under the caption Exposition in City of Panama):

"That the President be, and he is hereby, authorized to accept an invitation extended by the Government of Panama to the Government of the United States to participate in an exposition to be held in the city of Panama; and the sum of \$25,000 be, and the same is hereby appropriated, out of any money in the Treasury not otherwise appropriated, to enable suitable participation in said exposition by this



country, for an appropriate exhibit of the arts, industries, manufactures, products of the soil, mines, and waters of the United States, and, as far as practicable, of the functions of the General Government, and an exhibit of such other articles as the President may direct, including an exhibit relating to the Panama Canal."

General Deficiency Appropriation Act, approved March 4, 1915 (Public No. 296).

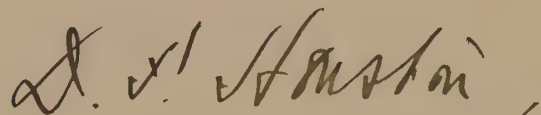
Page 19 (Under the caption Government Printing Office, Public Printing and Binding):

"The cost of printing and binding done for the General Supply Committee during the fiscal year nineteen hundred and fifteen shall be borne proportionately out of the allotments for printing and binding of the several executive departments and other Government establishments, based as nearly as may be on the services rendered them respectively by said committee."

Page 27 (Under Miscellaneous provisions):

"Sec. 4. That the reappropriation and diversion of the unexpended balance of any appropriation to a purpose other than that for which it was originally made shall be construed and accounted hereafter as a new appropriation and the unexpended balance shall be reduced by the sum proposed to be so diverted."

"Sec. 5. That the executive departments and other Government establishments and all branches of the public service may hereafter exchange typewriters, adding machines, and other similar labor saving devices in part payment for new machines used for the same purpose as those proposed to be exchanged. There shall be submitted to Congress, on the first day of the session following the close of each fiscal year, a report showing, as to each exchange hereunder, the make of the article, the period of its use, the allowance therefor, and the article, make thereof, and price, including exchange value, paid or to be paid for each article procured through such exchange."



Secretary.

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D.C.

file copy

March 18, 1915.

MEMORANDUM NO. 124.

PLEASE RETURN TO THE

SECRETARY'S FILE ROOM.

Regarding Proposed Changes in the Weekly News
Letter and the Establishment of a
Departmental Organ.

In view of certain points brought out at the meeting of editorial representatives appointed to assist in developing a Departmental organ, I have decided that it will best serve the desired end to issue the proposed Departmental periodical as a circular of the Secretary's Office rather than as a supplement to the News Letter. The News Letter itself will be so modified in its makeup as to make it a popular chronicle of the major activities of the Department. The personnel of the Department will be added to the present mailing list of the News Letter. The Departmental Circular will not be inaugurated until the changes in the News Letter have been worked out and well established.

It is proposed to enlarge the News Letter and to supplement matter of the character customarily carried at present with sufficient additional matter relative to general policy, program and progress of work on projects to give the average reader a fair idea of the aims and activities of the Department as a whole. The News Letter will be a medium for making announcement of important changes in policy or organization and of giving circulation to other matter of kindred nature which might be of interest to anyone connected with the Department, however remotely.

An announcement in which it will be explained that the News

Letter is designed for all persons directly concerned in the work of the Department of Agriculture, including Crop Correspondents and others working in collaboration with the Department, will be carried as a standing feature. The periodical will be called the "Weekly News Letter of the United States Department of Agriculture."

The proposed changes in the News Letter will be inaugurated as soon as sufficient copy of the desired character is forthcoming. To this end it is requested that the several editorial representatives appointed by the Bureaus and Offices begin at once to submit matter bearing on the general lines suggested. The change is essentially in the nature of an experiment and the development of the plan must necessarily be an evolution; hence each editor is urged to submit all matter which in his judgment, will serve the end in view-- the making of a thoroughly interesting popular chronicle of the activities of the Department. It is essential to have an abundance of such matter to choose from in order to give the publication the variety and scope desired.

All copy should be sent to Mr. G. W. Wharton, Chief, Office of Information. It must be borne in mind that Mr. Wharton and his staff are now kept very busy handling the routine press matter of the Department; thus they should not be expected, for the present at least, to go farther in the actual preparation of matter for the revised News Letter than they have gone in the past in the preparation of such matter. I therefore request Chiefs of Bureaus and Offices to impress upon their editorial representatives the fact that each is responsible for the representation of his Bureau or

Office in the News Letter and the Departmental Circular, and to
hope that the heartiest cooperation be given Mr. Wharton in this
regard.

The proposed Departmental organ, to be called the "Departmental Circular," or by some other title of like character, will
be designed exclusively for the personnel of the Department proper
and will serve as a bulletin board for the various Bureaus and
Offices. When the time comes for the inauguration of this circular
the editorial representatives already appointed in this connection
will be called upon to help in shaping the new periodical.

Carl Vrooman

Acting Secretary

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the Secretary's File Room

DEPARTMENT OF AGRICULTURE
WASHINGTON

March 18, 1915.

MEMORANDUM NO. 125.

Regarding Clerical Committees on Efficiency.

Paragraph 20 of the Administrative Regulations, as amended
by Memorandum No. ¹¹² ~~111~~, dated December 4, 1914, is hereby further
amended so as to read as follows:

"20. COMMITTEE ON EFFICIENCY.--There shall be a committee on efficiency in each bureau, division, and office, appointed by the Secretary or Acting Secretary, consisting of not more than three members (in the case of the Weather Bureau, not more than five members), to consider the semiannual efficiency reports, and other pertinent facts, and determine the relative standing of employees.

The term of service of the chairman of each committee shall be indeterminate, but the other members shall serve one year only, their terms of service expiring alternately on January 31 and July 31 of each year. On or before each of these dates, the chief of each bureau, independent division, office, and board, shall submit to the Secretary the name of a representative to take the place of the member whose term expires, together with a full statement regarding the qualifications of such representative for service on the committee. No person, however, shall be eligible for reappointment on any committee within one year from the termination of his (or her) last period of service.

In the case of the Weather Bureau, the terms of two members shall expire on January 31 and of two other members on July 31."

As the efficiency registers for the current half-year have already been prepared, the term of service of one member of each committee (in the case of the Weather Bureau, two members) expires at once. Accordingly, each chief of bureau, independent division, office, and board is requested immediately to submit to the Secretary the name of a representative to take the place of the member whose term expires at this time, together with a full statement of the qualifications of such representative for service on the committee.

In the case of the Weather Bureau the names of two representatives should be submitted.

D. S. Houston,
Secretary.

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DEPARTMENT OF AGRICULTURE
WASHINGTON

March 26, 1915.

MEMORANDUM NO. 126.

Regarding Motion Picture Work.

The Committee on Motion Picture Activities, after careful review of the experimental work of developing educational motion picture films extending over the last year and a half, has found it desirable to standardize the taking of motion pictures in certain particulars with the objects of preventing waste of material, obviating loss of time on the part of those engaged in field work, and of assuring better results in the finished product.

One of the chief sources of waste, the Committee finds, results from the attempt to take subjects for which a complete scenario has not previously been developed and given to the photographer for careful study before he begins the actual work of photography. Several such cases, where an attempt was made to take the scenes without prearrangement, have led to the photographing of hundreds of feet of film, which afterwards was found useless, and have resulted in films lacking in continuity. As a result, in some instances, it was necessary for the photographer to return to the field to take phases of the subject

which were omitted, or to retake scenes where attempts to take films without careful rehearsal and preparation or need for haste prevented securing perfect photographic results.

In other cases the scientific director of the work, in his eagerness to obtain certain scenes, has overruled the photographic expert's decision that conditions of lighting or the method of action made good motion picture photography impossible.

The Committee has found also that insistence on taking scenes in specific geographic districts when the geographic location is not essential adds greatly to the expense of making films which could be developed and staged more effectively in or about Washington. This insistence on treating a certain geographic area also has a tendency to give films a special geographic application which lessens their general application. In many cases less emphasis placed on the actual district in which the picture is taken would greatly extend the territorial application of the film.

To avoid these difficulties, and in the interest of economy and efficiency, the following rules hereafter will govern the motion picture work:

1. No motion picture work will be undertaken until a definite and complete scenario has been submitted and approved and time given for the photographic laboratory to study the scenario from the photographic standpoint.
2. Before any motion picture is taken, the scientist in charge of the subject shall go over the ground with the photographic director and definitely map out the scenes.
3. In matters of photography, the opinion of the photographic director as to the feasibility of taking the subject, proper lighting, etc., shall be final.

4. So far as practicable, scenes not essentially related to a special region should be staged in or about Washington, where facilities exist for the more effective and economical setting of the scenes.

5. Films should be nonsectional, with the idea that they will be of service to the entire Department, in so far as these objects can be achieved without interference with the specific educational purpose of the film.

Chiefs of bureaus, independent divisions, offices, and boards are requested to cooperate with the Committee in its efforts to develop the motion picture work of the Department, and are instructed to plan all motion picture projects in accordance with these rules.

D. P. Houston,

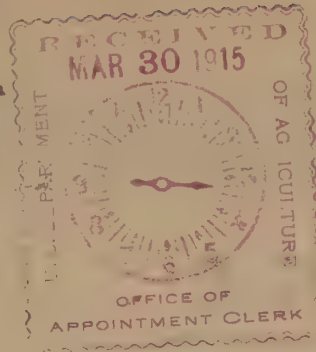
Secretary.

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DEPARTMENT OF AGRICULTURE

WASHINGTON

March 27, 1915.

MEMORANDUM NO. 127

Regarding changes in and correspondence relating to
the personnel of the Department.

In order to secure a more satisfactory and uniform system
in regard to matters pertaining to the personnel of the Depart-
ment, the following instructions must be strictly complied with
by the various Bureaus, Offices and Divisions:

1. No appointment, transfer, promotion, or other action
of like nature, relating to the personnel in Washington, D. C.,
shall be made effective, nor shall any person selected for ap-
pointment in Washington, D. C., actually be set to work until a
written recommendation from the Chief of Bureau for such action
shall have been approved by the Secretary of Agriculture. All
urgent cases will be given special attention by the Appointment
Clerk immediately upon receipt of recommendation. It is sug-
gested that "special" slips be used in such cases.

2. Hereafter any temporary appointment in Washington, D. C.,
which is limited by the Civil Service Commission to a specific
date, will be terminated on the date of expiration, unless au-
thority from the Commission for the extension of such temporary
appointment shall have been secured, or a recommendation from
the Chief of Bureau for its termination has been received by the
Appointment Clerk prior to the date of expiration. A written
notice of the date of expiration of all such temporary appoint-
ments shall be sent by the Appointment Clerk, to the Bureau af-
fected at least ten days prior to the date of such expiration.
The Chief of Bureau should, therefore, act promptly upon receipt
of this notice.

3. Hereafter letters to the Civil Service Commission re-
garding appointments and other matters pertaining to the person-
nel of the Department, other than those relating to purely rout-

ine matters, may be prepared for the signature of the Secretary in the Bureau, Division or Office concerned and transmitted to the Commission through the Appointment Clerk.

L. S. Houston,

Secretary.

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the Secretary's File Room

DEPARTMENT OF AGRICULTURE

WASHINGTON
March 31, 1915.

MEMORANDUM NO. 128.

Amendment to Fiscal Regulations.

Paragraphs 4 and 28 of the Fiscal Regulations are hereby amended to read as follows:

4. The SECRETARY, on or before the beginning of each fiscal year, WILL ISSUE A GENERAL LETTER of authorization TO EACH CHIEF OF BUREAU, authorizing him, during that year, within the terms of the appropriations specified in the letter, (a) to direct in writing employees of his bureau to perform routine travel within the continental United States, in conformity with law, the decisions of the Comptroller of the Treasury, and the fiscal regulations, and to allow per diems in lieu of subsistence, when desirable, at rates fixed by the Secretary; (b) to issue purchase orders for supplies in amounts not exceeding \$500 in the Weather Bureau, \$500 in the Forest Service, and \$100 in each other bureau, for a single order; (c) to incur other miscellaneous expenses, except in connection with advertising, the purchase of medicines for personal use, the purchase of cameras and lenses, the purchase of motor-driven vehicles or boats, and the employment of stenographic or typewriting service in the field other than as provided in paragraph 78, section n, as may be necessary properly to carry on the work of the bureau; and (d) to empower his subordinates to direct routine travel and incur necessary expenses within the limits of the authority conferred on him by his letter of authorization from the Secretary. The total liabilities to be incurred under a letter of authorization will be limited to the quarterly allotments annually approved by the Secretary in accordance with law.

28. All REQUISITIONS for the purchase of supplies, or for job work, in EXCESS OF \$100 must be APPROVED BY THE SECRETARY, except in case of the Weather Bureau and the Forest Service, which may issue requisitions for amounts not exceeding \$500;

but NO AUTOMOBILES, motor boats, OR other motor-driven vehicles, NO CAMERAS OR LENSES, and no MEDICINES for personal use (see paragraph 78, section m), shall be PURCHASED WITHOUT SPECIFIC AUTHORITY of the Secretary.

The object of this amendment is to require that on and after April 1, 1915, the approval of the Secretary shall be secured for the purchase of all cameras and lenses.

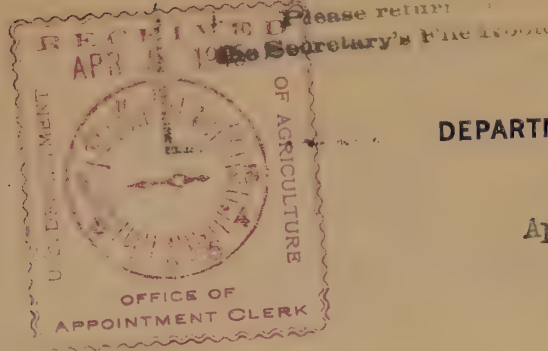
D. S. H. Smith,

Secretary.

W. A. Taylor

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DEPARTMENT OF AGRICULTURE

WASHINGTON

April 1, 1915.

MEMORANDUM NO. 129.

Reorganization of the Work of the Department of
Agriculture.

Preliminary to the carrying into effect on July 1, 1915, of the plan of reorganizing the Department, as outlined in Memorandum No. 121 of March 10, 1915, it is ordered that, in addition to the duties heretofore performed by them, during the remainder of the fiscal year 1915, Dr. A. D. Melvin will supervise that part of the poisonous plant investigations relating to the effect of such plants on animals in the Bureau of Plant Industry; Mr. W. A. Taylor will supervise the soil fertility investigations in the Bureau of Soils; the States Relations Committee will supervise the farm demonstration work in the northern and western States and in the southern States in the Bureau of Plant Industry; Dr. A. C. True will supervise the farm home management work in the Bureau of Plant Industry; Mr. L. W. Page will supervise the farm architectural work in the Bureau of Plant Industry and the irrigation and drainage investigations in the Office of Experiment Stations; and Mr. C. J. Brand will supervise

the farm credit and farm insurance investigations and the cotton standardization work, with the exception of certain technological investigations, in the Bureau of Plant Industry. The ^{work of the office of} farm management ~~investigations~~ in the Bureau of Plant Industry will be supervised by the Secretary.

X. S. Houston,
Secretary.

DEPARTMENT OF AGRICULTURE.
OFFICE OF THE SECRETARY
WASHINGTON, D.C.

PLEASE RETURN TO THE
SECRETARY'S FILE ROOM.

April 5, 1915.

MEMORANDUM NO. 130.

AMENDMENTS TO THE FISCAL REGULATIONS.

Authorization for the temporary employment of stenographers and typewriters in the field; acceptance of bids and notice thereof at certain experiment stations; non-prorating of laundry charges; long-distance telephone calls; transportation of household effects; listing in expense accounts of places visited and hour of arrival at and departure therefrom; and revised table of telegraph rates (Appendix D).

The paragraphs and sections of paragraphs, identified by the numbers and letters, respectively, set out below, and appendix D, of the Fiscal Regulations of this Department, adopted December 15, 1914, are hereby amended, effective May 1, 1915, so as to read as follows:

3. The Secretary will issue specific individual letters of authorization in all cases involving (a) general travel, other than routine, within the continental United States; (b) travel to or from points outside of the continental United States; (c) travel and other expenses, except for the purchase of supplies, to be paid from the contingent fund; (d) such

travel for the purpose of attending meetings or delivering lectures as is not otherwise provided for in Paragraph 92, Administrative Regulations; (e) travel by persons not connected with the Department incidental to consultations with the Secretary or his designated representatives; and (f) the employment of stenographic and typewriting service in the field other than as provided for in Paragraph 78, section (n).

30. No price shall be accepted unless it is reasonable. All bids and proposals shall be subject to these regulations. The contract of purchase will be complete and binding upon acceptance by the Department of a bid or proposal. The Chief of the Weather Bureau and the Forester, or a district forester when previously authorized in writing by the Forester, may accept bids or proposals when the amount involved is five hundred dollars or less, and shall, respectively, give notice of all acceptances by themselves. An official in charge of an experiment station in Alaska, Hawaii, Porto Rico, or the Island of Guam, when previously authorized in writing by the Secretary, may accept bids or proposals up to amounts fixed in such authorization, and shall give notice of his acceptance thereof. In all other cases acceptances and notices thereof will be by the Secretary. Except in cases in which, pursuant to Paragraph 144 of the Administrative Regulations, there may be a waiver, as evidence of contracts of purchase, the Secretary will sign, and may require the bidder or maker of a proposal to sign, a written contract when the amount involved is one thousand dollars or more. When less than fifty dollars is involved, and answers to inquiries, made in compliance with the Fiscal Regulations, result in quotations of reasonable prices, the lowest price quoted may be used informally by the chief of the bureau concerned as the basis of purchases in the open market. Unless otherwise stated in the specifications, or advertisement for bids or proposals, or in the contract of purchase, the Department shall be bound only for the particular supplies specified therein, and shall not be bound for supplies which may be purchased at any other time during that fiscal year.

64. In special cases letters of authorization may include office or laboratory rent, rental of tools, implements and machinery, rental of telephone, post-office box rent, the purchase of furniture, street car fares when traveling on official business at official station, and such unusual expenses as may be necessary to the proper conduct of the work.

78 (h). Customary charges for subsistence expenses, not to exceed in the aggregate \$5 for any one day, may be allowed,

and will include all expenses incurred for meals, lodging, bath, personal use of room at hotel during the day time, waiter fees not exceeding 30 cents in any one day, fees for checking and portorage of baggage upon arrival at and departure from hotels not to exceed 10 cents for portorage of, and 10 cents for checking, each piece, telegrams reserving hotel accommodations, laundry not exceeding \$1.40 a week, fractional parts of a week to be at the rate of 20 cents a day, and all other subsistence expenses. Charges for laundry must include all expenses incurred for that item during the period for which the voucher is rendered and must not include laundry items brought forward from previous periods. Charges incurred for laundry at official headquarters at the termination of a trip will not be allowed. Receipts for laundry must be submitted or a written statement filed with the account showing the impracticability of obtaining such receipts. A charge for lodging at a hotel and a charge for sleeper berth for the same night will be allowed only when accompanied by a definite statement of necessity.

78 (i). Expenses incurred for telegraph, cable, wireless, and telephone messages will be allowed when relating to the business for which the travel is being performed. Charges for long-distance telephone calls should show the points between which the messages are transmitted.

78 (p). An employee transferred from one official station to another for permanent duty when allowed traveling expenses may, within the discretion and under written instructions of the chief of the bureau in which he serves, be allowed packing, crating, freight, and drayage charges for the transfer of his household effects and other personal property used in official work, not exceeding in all 5,000 pounds, in addition to the weight of live stock: Provided, That saddle and other animals, not exceeding three head, will be transported at Government expense only when used in official work: And provided further, That all such shipments are made in accordance with the provisions of section (r) of this paragraph.

78 (r). Under the provisions of sections (p) and (q) of this paragraph shipments, if by common carrier, must be made on Departmental bills of lading, and each account must refer to the authority for the shipment and be accompanied by the certificate of the officer best qualified to make it that the property so shipped consists of the household goods of the employee transferred and is exclusively his property, that all other personal property so transferred is to be used in official work, and that the transportation was furnished on the

occasion of his permanent transfer to a new official station. If the weight of the shipment exceeds 5,000 pounds, the employee must ship the excess weight on a commercial bill of lading and pay the charges on same from his private funds; he must not, under any circumstances, ship more than 5,000 pounds on the Departmental bill of lading.

89 (d). Travel accounts must provide a detailed statement of travel performed, showing starting point, date and hour of departure from and arrival at official headquarters or temporary station, if any, and, when travel is continuous from one month to another, the location of the traveler at the close of the preceding month. Transportation or subsistence furnished without charge to the Department should be indicated, and all leave taken should be noted. All items of expense charged must show the locality and State in which incurred; charges for separate meals must show the cities or towns in which the same were obtained. An account covering a specific trip may be rendered at its conclusion.

APPENDIX D

Table of rates for telegrams
prescribed by the Postmaster General.

RATES FOR TELEGRAMS.

Table showing tolls for twenty words and multiples of twenty together with tolls for additional words.

Number of words.	Day Messages.					Night Messages.	
	When	When	When	When	When	When	When
	rate is	rate is	rate is	rate is	rate is	rate is	rate is
	20c.	25c.	30c.	35c.	40c.	20, 25 or 30c.	35 or 40c.
20 words	\$0.20	\$0.25	\$0.30	\$0.35	\$0.40	\$0.15	\$0.25
40 words	.40	.50	.60	.70	.80	.35	.45
60 words	.60	.75	.90	1.05	1.20	.55	.65
80 words	.80	1.00	1.20	1.40	1.60	.75	.85
100 words	1.00	1.25	1.50	1.75	2.00	.95	1.05
200 words	2.00	2.50	3.00	3.50	4.00	1.95	2.05
300 words	3.00	3.75	4.50	5.25	6.00	2.95	3.05
400 words	4.00	5.00	6.00	7.00	8.00	3.95	4.05
500 words	5.00	6.25	7.50	8.75	10.00	4.95	5.05
Additional words.							
1	.01	.01	.02	.02	.02	.01	.01
2	.02	.03	.03	.04	.04	.02	.02
3	.03	.04	.05	.05	.06	.03	.03
4	.04	.05	.06	.07	.08	.04	.04
5	.05	.06	.08	.09	.10	.05	.05
6	.06	.08	.09	.11	.12	.06	.06
7	.07	.09	.11	.12	.14	.07	.07
8	.08	.10	.12	.14	.16	.08	.08
9	.09	.11	.14	.16	.18	.09	.09
10	.10	.13	.15	.18	.20	.10	.10
11	.11	.14	.17	.19	.22	.11	.11
12	.12	.15	.18	.21	.24	.12	.12
13	.13	.16	.20	.23	.26	.13	.13
14	.14	.18	.21	.25	.28	.14	.14
15	.15	.19	.23	.26	.30	.15	.15
16	.16	.20	.24	.28	.32	.16	.16
17	.17	.21	.26	.30	.34	.17	.17
18	.18	.23	.27	.32	.36	.18	.18
19	.19	.24	.29	.33	.38	.19	.19

TABLE OF DAY RATES FOR UNITED STATES GOVERNMENT TELEGRAPH
MESSAGES OF TWENTY WORDS OR LESS, COUNTING ADDRESS, BY WORDS, AND SIGNATURE.

-7-

	Ala	Ari	Ark	Cal	Col	Con	Del	D	C	Fla	Ga	Ida	Ill	Ind	Ia	Kan	Ky	La	Me	Md	Mas	Mic	Min	Mis	Mo
	z				n															s	h	n	s		
Alabama_____	20	30	20	40	25	25	20	20	20	20	35	20	20	20	20	20	20	20	25	20	25	20	25	20	20
Arizona_____	30	20	25	20	25	40	40	35	30	30	25	30	30	30	25	30	25	40	40	40	35	30	25	30	
Arkansas_____	20	25	20	35	20	25	25	25	20	20	30	20	20	20	20	20	20	20	30	25	25	20	20	20	20
California_____	40	20	35	20	25	40	40	40	40	40	25	35	35	30	30	35	35	40	40	40	35	30	35	30	
Colorado_____	25	25	20	25	20	30	30	30	30	25	20	20	25	20	20	25	25	35	30	35	25	20	25	20	
Connecticut_____	25	40	25	40	30	20	20	20	25	20	40	25	20	25	25	20	30	20	20	20	20	25	25	25	
Delaware_____	20	40	25	40	30	20	20	20	20	20	40	20	20	25	25	20	25	20	20	20	20	25	25	25	
D. C._____	20	35	25	40	30	20	20	20	20	20	40	20	20	25	25	20	25	20	20	20	20	25	25	25	
Florida_____	20	30	20	40	30	25	20	20	20	20	35	20	20	25	25	20	20	25	20	25	25	25	20	20	
Georgia_____	20	30	20	40	25	20	20	20	20	20	35	20	20	20	20	20	20	25	20	25	20	25	20	20	
Idaho_____	35	25	30	25	20	40	40	40	35	35	20	30	30	25	25	35	35	40	40	40	35	30	35	30	
Illinois_____	20	30	20	35	20	25	20	20	20	20	30	20	20	20	20	20	20	25	20	25	20	20	20	20	
Indiana_____	20	30	20	35	25	20	20	20	20	20	30	20	20	20	20	20	20	25	20	20	20	20	20	20	
Iowa_____	20	30	20	30	20	25	25	25	25	20	25	20	20	20	20	20	25	30	25	25	20	20	20	20	
Kansas_____	20	25	20	30	20	25	25	25	25	20	25	20	20	20	20	20	20	30	25	30	20	20	20	20	
Kentucky_____	20	20	20	35	25	20	20	20	20	20	35	20	20	20	20	20	20	25	20	25	20	20	20	20	
Louisiana_____	20	25	20	35	25	30	25	25	20	20	35	20	20	25	20	20	20	30	25	30	25	25	20	20	
Maine_____	25	40	30	40	35	20	20	20	25	25	40	25	25	30	30	25	30	20	20	20	20	25	30	25	
Maryland_____	20	40	25	40	30	20	20	20	20	20	40	20	20	25	25	20	25	20	20	20	20	25	25	25	
Massachusetts_____	25	40	25	40	35	20	20	20	25	25	40	25	20	25	30	25	30	20	20	20	20	25	25	25	
Michigan_____	20	35	20	35	25	20	20	20	25	20	35	20	20	20	20	20	20	25	20	20	20	20	20	20	
Minnesota_____	25	30	20	30	20	25	25	25	25	25	30	20	20	20	20	20	20	25	25	25	25	20	20	25	20
Mississippi_____	20	25	20	35	25	25	25	25	20	20	35	20	20	20	20	20	20	30	25	25	20	25	20	20	
Missouri_____	20	30	20	30	20	25	25	25	20	20	30	20	20	20	20	20	20	25	25	25	20	20	20	20	
Montana_____	35	25	30	25	20	35	35	35	35	35	20	30	30	25	25	30	35	35	35	35	30	25	30	25	
Nebraska_____	20	25	20	30	20	25	25	25	25	25	25	20	20	20	20	20	20	30	25	30	20	20	20	20	
Nevada_____	35	20	35	20	25	40	40	40	40	40	20	35	35	30	30	35	35	40	40	40	35	30	35	30	
New Hampshire_____	25	40	25	40	35	20	20	20	25	25	40	25	20	25	25	25	30	20	20	20	20	25	25	25	
New Jersey_____	20	40	25	40	30	20	20	20	25	20	40	20	20	25	25	20	25	20	20	20	20	25	25	25	
New Mexico_____	25	20	20	25	20	35	35	30	30	30	25	25	25	25	20	25	25	35	35	35	30	25	25	25	
New York_____	25	40	25	40	30	20	20	20	25	25	40	20	20	25	25	20	30	20	20	20	20	25	25	25	
North Carolina_____	20	35	20	40	30	20	20	20	20	20	40	20	20	25	25	20	20	20	20	20	20	25	20	25	
North Dakota_____	30	30	25	30	20	30	30	30	30	30	25	20	25	20	20	25	30	30	30	30	25	20	25	20	
Ohio_____	20	35	20	35	25	20	20	20	20	20	35	20	20	20	20	20	20	20	20	20	20	20	20	20	
Oklahoma_____	20	25	20	35	20	30	30	25	25	20	30	20	20	20	20	20	20	30	25	30	25	20	20	20	
Oregon_____	40	25	35	20	25	40	40	40	40	40	20	35	35	30	30	40	40	40	40	40	35	30	40	35	
Pennsylvania_____	20	35	25	40	30	20	20	20	20	20	40	20	20	25	25	20	25	20	20	20	20	25	25	20	
Rhode Island_____	25	40	25	40	35	20	20	20	25	25	40	25	20	25	30	25	30	20	20	20	20	25	25	25	
South Carolina_____	20	35	20	40	30	20	20	20	20	20	40	20	20	25	25	20	20	25	20	20	20	25	20	20	
South Dakota_____	25	30	25	30	20	30	30	30	30	25	25	20	20	20	20	25	25	30	30	30	20	20	25	20	
Tennessee_____	20	30	20	35	25	25	20	20	20	20	35	20	20	20	20	20	20	25	20	25	20	20	20	20	
Texas_____	20	25	20	30	20	30	30	30	20	20	30	20	25	20	20	25	20	35	30	30	25	25	20	20	
Utah_____	30	20	25	20	20	35	35	35	35	35	20	25	30	25	25	30	30	40	35	35	30	25	30	25	
Vermont_____	25	40	25	40	30	20	20	20	25	25	40	25	20	25	25	20	30	20	20	20	20	25	30	25	
Virginia_____	20	35	25	40	30	20	20	20	20	20	40	20	20	25	25	20	25	20	20	20	20	25	20	25	
Washington_____	40	30	35	20	25	40	40	40	40	40	20	35	40	30	30	40	40	40	40	40	40	30	40	35	
West Virginia_____	20	35	20	40	25	20	20	20	20	20	35	20	20	20	20	20	25	20	20	20	20	20	20	20	
Wisconsin_____	20	30	20	35	20	25	20	20	25	20	30	20	20	20	20	20	20	25	20	25	20	20	20	20	
Wyoming_____	25	25	25	25	20	30	30	30	30	30	20	20	25	20	20	25	25	35	30	30	25	20	25	20	

TABLE OF DAY RATES FOR UNITED STATES GOVERNMENT TELEGRAPH
MESSAGES OF TWENTY WORDS OR LESS, COUNTING ADDRESS, BY WORDS, AND SIGNATURE.

	Me t	Ne	Nev	NH	NJ	NM	NY	NC	ND	OK a	Or	Pa	RI	SC	SD	Ten n	Tex h	Utah	Vt	Va h	WVa	Wis	Wyo		
Alabama_____	35	20	35	25	20	25	25	20	30	20	20	40	20	25	20	25	20	20	30	25	20	40	20	20	25
Arizona_____	25	25	20	40	40	20	40	35	30	35	25	25	35	40	35	30	30	25	20	40	35	30	35	30	25
Arkansas_____	30	20	35	25	25	20	25	20	25	20	20	35	25	25	20	25	20	20	25	25	25	35	20	20	25
California_____	25	30	20	40	40	25	40	40	30	35	30	20	40	40	40	30	35	30	20	40	40	20	40	35	25
Colorado_____	20	20	25	35	30	20	30	30	20	25	20	25	30	35	30	20	25	20	20	30	30	25	25	20	20
Connecticut_____	35	25	40	20	20	35	20	20	30	20	30	40	20	20	20	30	25	30	35	20	20	40	20	25	30
Delaware_____	35	25	40	20	20	35	20	20	30	20	30	40	20	20	20	30	20	30	35	20	20	40	20	20	30
D. C._____	35	25	40	20	20	30	20	20	30	20	25	40	20	20	20	30	20	30	35	20	20	40	20	20	30
Florida_____	35	25	40	25	25	30	25	20	30	20	25	40	20	25	20	30	20	20	35	25	20	40	20	25	30
Georgia_____	35	25	40	25	20	30	25	20	30	20	20	40	20	25	20	25	20	20	35	25	20	40	20	20	30
Idaho_____	20	25	20	40	40	25	40	40	25	35	30	20	40	40	40	25	35	30	20	40	40	20	35	30	20
Illinois_____	30	20	35	25	20	25	20	20	20	20	20	35	20	25	20	20	20	20	25	25	20	35	20	20	20
Indiana_____	30	20	35	20	20	25	20	20	25	20	20	35	20	20	20	20	20	25	30	20	20	40	20	20	25
Iowa_____	25	20	30	25	25	25	25	25	20	20	20	30	25	25	25	20	20	20	25	25	25	30	20	20	20
Kansas_____	25	20	30	25	25	20	25	25	20	20	20	30	25	30	25	20	20	20	25	25	25	30	20	20	20
Kentucky_____	30	20	35	25	20	25	20	20	25	20	20	40	20	25	20	25	20	25	30	20	20	40	20	20	25
Louisiana_____	35	20	35	30	25	25	30	20	30	20	20	40	25	30	20	25	20	20	30	30	25	40	25	20	25
Maine_____	35	30	40	20	20	35	20	20	30	20	30	40	20	20	25	30	25	35	40	20	20	40	20	25	35
Maryland_____	35	25	40	20	20	35	20	20	30	20	25	40	20	20	20	30	20	30	35	20	20	40	20	20	30
Massachusetts_____	35	30	40	20	20	35	20	20	30	20	30	40	20	20	20	30	25	30	35	20	20	40	20	25	30
Michigan_____	30	20	35	20	20	30	20	20	25	20	25	35	20	20	20	20	20	25	30	20	20	40	20	20	25
Minnesota_____	25	20	30	25	25	25	25	25	20	20	20	30	25	25	25	20	20	25	25	25	25	30	20	20	20
Mississippi_____	30	20	35	25	25	25	25	20	25	20	20	40	25	25	20	25	20	20	30	30	20	40	20	20	25
Missouri_____	25	20	30	25	25	25	25	25	20	20	20	35	20	25	20	20	20	20	25	25	25	35	20	20	20
Montana_____	20	25	25	35	35	25	35	35	20	30	25	20	35	35	35	20	30	30	20	35	35	20	30	25	20
Nebraska_____	25	20	30	30	25	20	25	25	20	20	20	30	25	30	25	20	20	20	20	25	25	30	20	20	20
Nevada_____	25	30	20	40	40	25	40	40	30	35	30	20	40	40	40	30	35	35	20	40	40	20	35	30	25
New Hampshire_____	35	30	40	20	20	35	20	20	30	20	30	40	20	20	20	30	25	30	40	20	20	40	20	25	30
New Jersey_____	35	25	40	20	20	35	20	20	30	20	30	40	20	20	20	30	20	30	35	20	20	40	20	20	30
New Mexico_____	25	20	25	35	35	20	35	35	25	30	20	30	30	35	30	20	25	20	20	35	30	30	30	25	20
New York_____	35	25	40	20	20	35	20	20	30	20	30	40	20	20	20	30	25	30	35	20	20	40	20	20	30
North Carolina_____	35	25	40	20	20	35	20	20	30	20	25	40	20	20	20	30	20	25	35	20	20	40	20	25	30
North Dakota_____	20	20	30	30	30	25	30	30	20	25	25	25	30	30	30	20	25	25	25	30	30	25	25	20	20
Ohio_____	30	20	35	20	20	30	20	20	25	20	20	40	20	20	20	25	20	25	30	20	20	35	20	20	25
Oklahoma_____	25	20	30	30	30	20	30	25	25	20	20	35	25	30	25	20	20	20	25	30	25	35	25	20	20
Oregon_____	20	30	20	40	40	30	40	40	25	40	35	20	40	40	40	30	40	35	20	40	40	20	40	35	25
Pennsylvania_____	35	25	40	20	20	30	20	20	30	20	25	40	20	20	20	25	20	30	35	20	20	40	20	20	30
Rhode Island_____	35	30	40	20	20	35	20	20	30	20	30	40	20	20	20	30	25	30	40	20	20	40	20	25	30
South Carolina_____	35	25	40	20	20	30	20	20	30	20	25	40	20	20	20	30	20	25	35	25	20	40	20	20	30
South Dakota_____	20	20	30	30	30	20	30	30	20	25	20	30	25	30	30	20	25	25	25	30	30	30	25	20	20
Tennessee_____	30	20	35	25	20	25	25	20	25	20	20	40	20	25	20	25	20	20	30	25	20	40	20	20	25
Texas_____	30	20	35	30	30	20	30	25	25	25	20	35	30	30	25	25	20	20	25	30	30	35	25	25	25
Utah_____	20	20	20	40	35	20	35	35	25	30	25	20	35	40	35	25	30	25	20	35	35	25	30	25	20
Vermont_____	35	25	40	20	20	35	20	20	30	20	30	40	20	20	25	30	25	30	35	20	20	40	20	25	30
Virginia_____	35	25	40	20	20	30	20	20	30	20	25	40	20	20	20	30	20	30	35	20	20	40	20	20	30
Washington_____	20	30	20	40	40	30	40	40	25	35	35	20	40	40	40	30	40	35	25	40	40	20	40	35	25
West Virginia_____	30	20	35	20	20	30	20	20	25	20	25	40	20	20	20	25	20	25	30	20	20	40	20	20	25
Wisconsin_____	25	20	30	25	20	25	20	25	20	20	20	35	20	25	20	20	20	25	25	25	20	35	20	20	20
Wyoming_____	20	20	25	30	30	20	30	30	20	25	20	25	30	30	30	20	25	25	20	30	30	25	25	20	20

D. F. Houston

Secretary

FILED

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MEMORANDUM NO. 1801) case 162

Please return to
the Secretary's File Room

AMENDMENTS TO THE FISCAL REGULATIONS.) case 157

Authorization for the temporary employment of stenographers and typewriters in the field; acceptance of bids and notice thereof at certain experiment stations; non-prorating of laundry charges; long-distance telephone calls; transportation of household effects; listing in expense accounts of places visited and hour of arrival at and departure therefrom; and revised table of telegraph rates (Appendix D).

The paragraphs and sections of paragraphs, identified by the numbers and letters, respectively, set out below, and appendix D, of the Fiscal Regulations of this Department, adopted December 15, 1914, are hereby amended, effective May 1, 1915, so as to read as follows:

3. The Secretary will issue specific individual letters of authorization in all cases involving (a) general travel, other than routine, within the continental United States; (b) travel to or from points outside of the continental United States; (c) travel and other expenses, except for the purchase of supplies, to be paid from the contingent fund; (d) such

travel for the purpose of attending meetings or delivering lectures as is not otherwise provided for in Paragraph 92, Administrative Regulations; (e) travel by persons not connected with the Department incidental to consultations with the Secretary or his designated representatives; and (f) the employment of stenographic and typewriting service in the field other than as provided for in Paragraph 78, section (n).

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30. No price shall be accepted unless it is reasonable. All bids and proposals shall be subject to these regulations. The contract of purchase will be complete and binding upon acceptance by the Department of a bid or proposal. The Chief of the Weather Bureau and the Forester, or a district forester when previously authorized in writing by the Forester, may accept bids or proposals when the amount involved is five hundred dollars or less, and shall, respectively, give notice of all acceptances by themselves. An official in charge of an experiment station in Alaska, Hawaii, Porto Rico, or the Island of Guam, when previously authorized in writing by the Secretary, may accept bids or proposals up to amounts fixed in such authorization, and shall give notice of his acceptance thereof. In all other cases acceptances and notices thereof will be by the Secretary. Except in cases in which, pursuant to paragraph 144 of the Administrative Regulations, there may be a waiver, as evidence of contracts of purchase, the Secretary will sign, and may require the bidder or maker of a proposal to sign, a written contract when the amount involved is one thousand dollars or more. When less than fifty dollars is involved, and answers to inquiries, made in compliance with the Fiscal Regulations, result in quotations of reasonable prices, the lowest price quoted may be used informally by the chief of the bureau concerned as the basis of purchases in the open market. Unless otherwise stated in the specifications, or advertisement for bids or proposals, or in the contract of purchase, the Department shall be bound only for the particular supplies specified therein, and shall not be bound for supplies which may be purchased at any other time during that fiscal year.

64. In special cases letters of authorization may include office or laboratory rent, rental of tools, implements and machinery, rental of telephone, post-office box rent, the purchase of furniture, street-car fares when traveling on official business at official station, and such unusual expenses as may be necessary to the proper conduct of the work.

78 (h). Customary charges for subsistence expenses, not to exceed in the aggregate \$5 for any one day, may be allowed, and will include all expenses incurred for meals, lodging, bath, personal use of room at hotel during the day time, waiter fees not exceeding 30 cents in any one day, fees for checking and portage of baggage upon arrival at and departure from hotels not to exceed 10 cents for portage of, and 10 cents for checking, each piece, telegrams reserving hotel accommodations, laundry not exceeding \$1.40 a week, fractional parts of a week to be at the rate of 20 cents a day, and all other subsistence expenses. Charges for laundry must include all expenses incurred for that item during the period for which the voucher is rendered and must not include laundry items brought forward from previous periods. Charges incurred for laundry at official headquarters at the termination of a trip will not be allowed. Receipts for laundry must be submitted or a written statement filed with the account showing the impracticability of obtaining such receipts. A charge for lodging at a hotel and a charge for sleeper berth for the same night will be allowed only when accompanied by a definite statement of necessity.

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78 (i). Expenses incurred for telegraph, cable, wireless, and telephone messages will be allowed when relating to the business for which the travel is being performed. Charges for long-distance telephone calls should show the points between which the messages are transmitted.

78 (p). An employee transferred from one official station to another for permanent duty when allowed traveling expenses may, within the discretion and under written instructions of the chief of the bureau in which he serves, be allowed packing, crating, freight, and drayage charges for the transfer of his household effects and other personal property used in official work, not exceeding in all 5,000 pounds, in addition to the weight of live stock: Provided, That saddle and other animals, not exceeding three head, will be transported at Government expense only when used in official work: And provided further, That all such shipments are made in accordance with the provisions of section (r) of this paragraph.

78 (r). Under the provisions of sections (p) and (q) of this paragraph shipments, if by common carrier, must be made on Departmental bills of lading, and each account must refer to the authority for the shipment and be accompanied by the certificate of the officer best qualified to make it that the property so shipped consists of the household goods of the employee transferred and is exclusively his property, that all other personal property so transferred is to be used in official work, and that the transportation was furnished on the occasion of his permanent transfer to a new official station. If the weight of the shipment exceeds 5,000 pounds, the employee must ship the excess weight on a commercial bill of lading and pay the charges on same from his private funds; he must not, under any circumstances, ship more than 5,000 pounds on the Departmental bill of lading.

89 (d). Travel accounts must provide a detailed statement of travel performed, showing starting point, date and hour of departure from and arrival at official headquarters or temporary station, if any, and, when travel is continuous from one month to another, the location of the traveler at the close of the preceding month. Transportation or subsistence furnished without charge to the Department should be indicated, and all leave taken should be noted. All items of expense charged must show the locality and State in which incurred; charges for separate meals must show the cities or towns in which the same were obtained. An account covering a specific trip may be rendered at its conclusion.

new order page
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APPENDIX D.) case 160

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Table of rates for telegrams
prescribed by the Postmaster General.

) case 159 caps

RATES FOR TELEGRAMS.

Table showing tolls for ²⁰twenty words and multiples of ²⁰twenty together with tolls for additional words. ²⁰8 ft. itd.

Number of words.	Day Messages.					Night Messages.	
	When	When	When	When	When	When	When
	rate is:	rate is:	rate is:	rate is:	rate is:	rate is:	rate is:
	20c.	25c.	30c.	35c.	40c.	20, 25, 35 or 30c.	40c.
20 words	\$0.20	\$0.25	\$0.30	\$0.35	\$0.40	\$0.15	\$0.25
40 words	.40	.50	.60	.70	.80	.35	.45
60 words	.60	.75	.90	1.05	1.20	.55	.65
80 words	.80	1.00	1.20	1.40	1.60	.75	.85
100 words	1.00	1.25	1.50	1.75	2.00	.95	1.05
200 words	2.00	2.50	3.00	3.50	4.00	1.95	2.05
300 words	3.00	3.75	4.50	5.25	6.00	2.95	3.05
400 words	4.00	5.00	6.00	7.00	8.00	3.95	4.05
500 words	5.00	6.25	7.50	8.75	10.00	4.95	5.05
Additional words:							
1	.01	.01	.02	.02	.02	.01	.01
2	.02	.03	.03	.04	.04	.02	.02
3	.03	.04	.05	.05	.06	.03	.03
4	.04	.05	.06	.07	.08	.04	.04
5	.05	.06	.08	.09	.10	.05	.05
6	.06	.08	.09	.11	.12	.06	.06
7	.07	.09	.11	.12	.14	.07	.07
8	.08	.10	.12	.14	.16	.08	.08
9	.09	.11	.14	.16	.18	.09	.09
10	.10	.13	.15	.18	.20	.10	.10
11	.11	.14	.17	.19	.22	.11	.11
12	.12	.15	.18	.21	.24	.12	.12
13	.13	.16	.20	.23	.26	.13	.13
14	.14	.18	.21	.25	.28	.14	.14
15	.15	.19	.23	.26	.30	.15	.15
16	.16	.20	.24	.28	.32	.16	.16
17	.17	.21	.26	.30	.34	.17	.17
18	.18	.23	.27	.32	.36	.18	.18
19	.19	.24	.29	.33	.38	.19	.19

TABLE OF DAY RATES FOR UNITED STATES GOVERNMENT TELEGRAPH
 MESSAGES OF TWENTY WORDS OR LESS, COUNTING ADDRESS, BY WORDS, AND
 SIGNATURE. 20

pt. tal. l.c.

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6 ft. nan. divide

divide stub 15

	Ala.	Ariz.	Ark.	Calif.	Col.	Conn.	Del.	D. C.	Fla.	Ga.	Ida.	Ill.	Ind.	Iowa.	Kans.	Ky.	La.	Me.	Md.	Mass.	Mich.	Minn.	Miss.	Mo.
Alabama.....	20	30	20	40	25	25	20	20	20	20	35	20	20	20	20	20	20	25	20	25	20	25	20	20
Arizona.....	30	20	25	20	25	40	40	35	30	30	25	30	30	30	25	30	25	40	40	40	35	30	25	30
Arkansas.....	20	25	20	35	20	25	25	25	20	20	30	20	20	20	20	20	20	30	25	25	20	20	20	20
California.....	40	20	35	20	25	40	40	40	40	40	25	35	35	30	30	35	35	40	40	40	35	30	35	30
Colorado.....	25	25	20	25	20	30	30	30	30	25	20	20	25	20	20	25	25	35	30	35	25	20	25	20
Connecticut.....	25	40	25	40	30	20	20	20	20	25	20	40	25	20	25	20	30	20	20	20	20	25	25	25
Delaware.....	20	40	25	40	30	20	20	20	20	20	40	20	20	25	25	20	25	20	20	20	20	25	25	25
District of Columbia.....	20	35	25	40	30	20	20	20	20	20	40	20	20	25	25	20	25	20	20	20	20	25	25	25
Florida.....	20	30	20	40	30	25	20	20	20	20	35	20	20	25	25	20	20	25	20	25	25	25	20	20
Georgia.....	20	30	20	40	25	20	20	20	20	20	35	20	20	20	20	20	20	25	20	25	25	25	20	20
Idaho.....	35	25	30	25	20	40	40	40	35	35	20	30	30	25	25	35	35	40	40	40	35	30	35	30
Illinois.....	20	30	20	35	20	25	20	20	20	20	30	20	20	20	20	20	20	25	20	20	20	20	20	20
Indiana.....	20	30	20	35	25	20	20	20	20	20	30	20	20	20	20	20	20	25	30	25	25	20	20	20
Iowa.....	20	30	20	30	20	25	25	25	25	20	25	20	20	20	20	20	20	30	25	30	20	20	20	20
Kansas.....	20	25	20	30	20	25	25	25	25	20	25	20	20	20	20	20	20	25	20	25	20	20	20	20
Kentucky.....	20	30	20	35	25	20	20	20	20	20	35	20	20	20	20	20	20	25	20	25	20	20	20	20
Louisiana.....	20	25	20	35	25	30	25	25	20	20	35	20	20	25	20	20	20	30	25	30	25	25	20	20
Maine.....	25	40	30	40	35	20	20	20	25	25	40	25	25	30	30	25	30	20	20	20	20	25	30	25
Maryland.....	20	40	25	40	30	20	20	20	20	20	40	20	20	25	25	30	25	20	20	20	20	25	25	25
Massachusetts.....	25	40	25	40	35	20	20	20	25	25	40	25	20	25	30	25	30	20	20	20	20	20	20	20
Michigan.....	20	35	20	35	25	20	20	20	25	25	30	20	20	20	20	20	20	25	25	25	20	20	25	20
Minnesota.....	25	30	20	30	20	25	25	25	25	25	30	20	20	20	20	20	20	30	25	25	20	25	20	20
Mississippi.....	20	25	20	35	25	25	25	25	20	20	35	20	20	20	20	20	20	25	25	25	20	20	20	20
Missouri.....	20	30	20	30	20	25	25	25	20	20	30	20	20	20	20	20	20	25	25	25	20	20	20	20
Montana.....	35	25	30	25	20	35	35	35	35	35	20	30	30	25	25	30	35	35	35	35	30	25	30	25
Nebraska.....	20	25	20	30	20	25	25	25	25	25	25	20	20	20	20	20	20	30	25	30	20	20	20	20
Nevada.....	35	20	35	20	25	40	40	40	40	40	20	35	35	30	30	35	35	40	40	40	35	30	35	30
New Hampshire.....	25	40	25	40	35	20	20	20	25	25	40	25	20	25	25	25	30	20	20	20	20	25	25	25
New Jersey.....	20	40	25	40	30	20	20	20	25	20	40	20	20	25	25	20	25	25	35	35	30	25	25	25
New Mexico.....	25	20	20	25	20	35	35	30	30	30	25	25	25	25	20	25	25	35	35	35	30	25	25	25
New York.....	25	40	25	40	30	20	20	20	25	25	40	20	20	25	25	20	30	20	20	20	20	25	20	25
North Carolina.....	20	35	20	40	30	20	20	20	20	20	40	20	20	25	20	20	20	20	20	20	20	25	20	25
North Dakota.....	30	30	25	30	20	30	30	30	30	30	25	20	25	20	20	20	25	30	30	30	30	25	20	25
Ohio.....	20	35	20	35	25	20	20	20	20	20	35	20	20	20	20	20	20	20	20	20	20	20	20	20
Oklahoma.....	20	25	20	30	20	30	30	25	25	20	30	20	20	20	20	20	20	30	25	30	25	20	20	20
Oregon.....	40	25	35	20	25	40	40	40	40	40	20	35	35	30	30	40	40	40	40	40	35	30	40	35
Pennsylvania.....	20	35	25	40	30	20	20	20	20	20	40	20	20	25	25	20	25	20	20	20	20	25	25	25
Rhode Island.....	25	40	25	40	35	20	20	20	25	25	40	25	20	25	30	25	30	20	20	20	20	25	25	25
South Carolina.....	20	35	20	40	30	20	20	20	20	20	40	20	20	25	25	20	20	25	20	20	20	25	20	20
South Dakota.....	25	30	25	30	20	30	30	30	30	30	25	25	20	20	20	20	25	30	30	30	30	20	20	20
Tennessee.....	20	30	20	35	25	25	20	20	20	20	35	20	20	20	20	20	20	25	20	25	20	20	20	20
Texas.....	20	25	20	30	20	30	30	30	30	20	30	20	25	20	20	25	20	35	30	30	25	25	20	20
Utah.....	30	20	25	20	20	35	35	35	35	35	20	25	30	25	25	30	30	40	35	35	30	25	30	25
Vermont.....	25	40	25	40	30	20	20	20	25	25	40	25	20	25	25	20	30	20	20	20	20	25	30	25
Virginia.....	20	35	25	40	30	20	20	20	20	20	40	20	20	25	25	20	25	20	20	20	20	25	20	25
Washington.....	40	30	35	20	25	40	40	40	40	40	20	35	40	30	30	40	40	40	40	40	40	30	40	35
West Virginia.....	20	35	20	40	25	20	20	20	20	20	35	20	20	20	20	20	20	25	20	25	20	20	20	20
Wisconsin.....	20	30	20	35	20	25	20	20	25	20	30	20	20	20	20	20	20	25	20	25	20	20	20	20
Wyoming.....	25	25	25	25	20	30	30	30	30	30	20	20	25	20	20	25	25	35	30	30	25	20	25	20

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